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Part 15

THE KNACK

The complete manual of DIY skills, projects and home ideas

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THE KNACK

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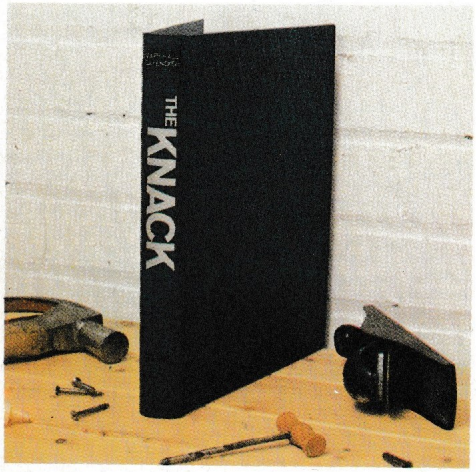

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Papering a stairwell

Choosing the right type of paper for the job ● Estimating quantities ● Erecting a safe and steady working platform ● Dealing with a wall handrail ● Papering around obstacles and banisters

Gavin Cochrane

The entrance hall in most homes includes a stairwell. And because the side walls—called well walls—are usually the highest interior walls of a house, this area is often the most difficult part of the home to decorate.

Before you attempt to hang paper in a stairwell, it is advisable to gain some experience by papering a normal room (see pages 82-87 and 200-204). Once you have mastered the basic techniques involved, it should be possible to paper a stairwell without difficulty.

Choosing the right wallpaper goes a long way towards determining how good a finish you finally achieve.

Above: *By employing the correct wallpapering techniques and using a suitable type of paper, you can transform a dark and narrow staircase*

Because well walls are much higher than other walls in the home any irregularities in the surface, such as corners that are out of true, are likely to be highlighted by unsuitable types.

Steer clear of striped paper as this will show up an irregularly sloping wall particularly badly. You may also find it hard to match up strips of wallpaper at the edges if the pattern is too large. For best results choose plain wallpaper or one with a small pattern.

Estimating quantities

Due to the irregular shape of a well wall where it meets the stairs, it is harder to work out how many rolls of paper you need than it is for a normal rectangular wall.

To make the job easier, divide the wall into two halves by drawing a line along the wall, extending horizontally from the floor of the landing. On a single-flight staircase, the space above this line is usually rectangular so simply calculate the area to work out the amount of paper required.

To estimate the amount needed for the area beneath the line, draw a vertical line at the foot of the stairs up to the horizontal. Depending on the slope of the stairs, the paper needed for this triangular section is between a half and two-thirds the amount you would need for a rectangle formed by the same horizontal and vertical measurements.

When you come to paper the ceiling of a stairwell, calculate the amount of paper needed as described on pages 200-204.

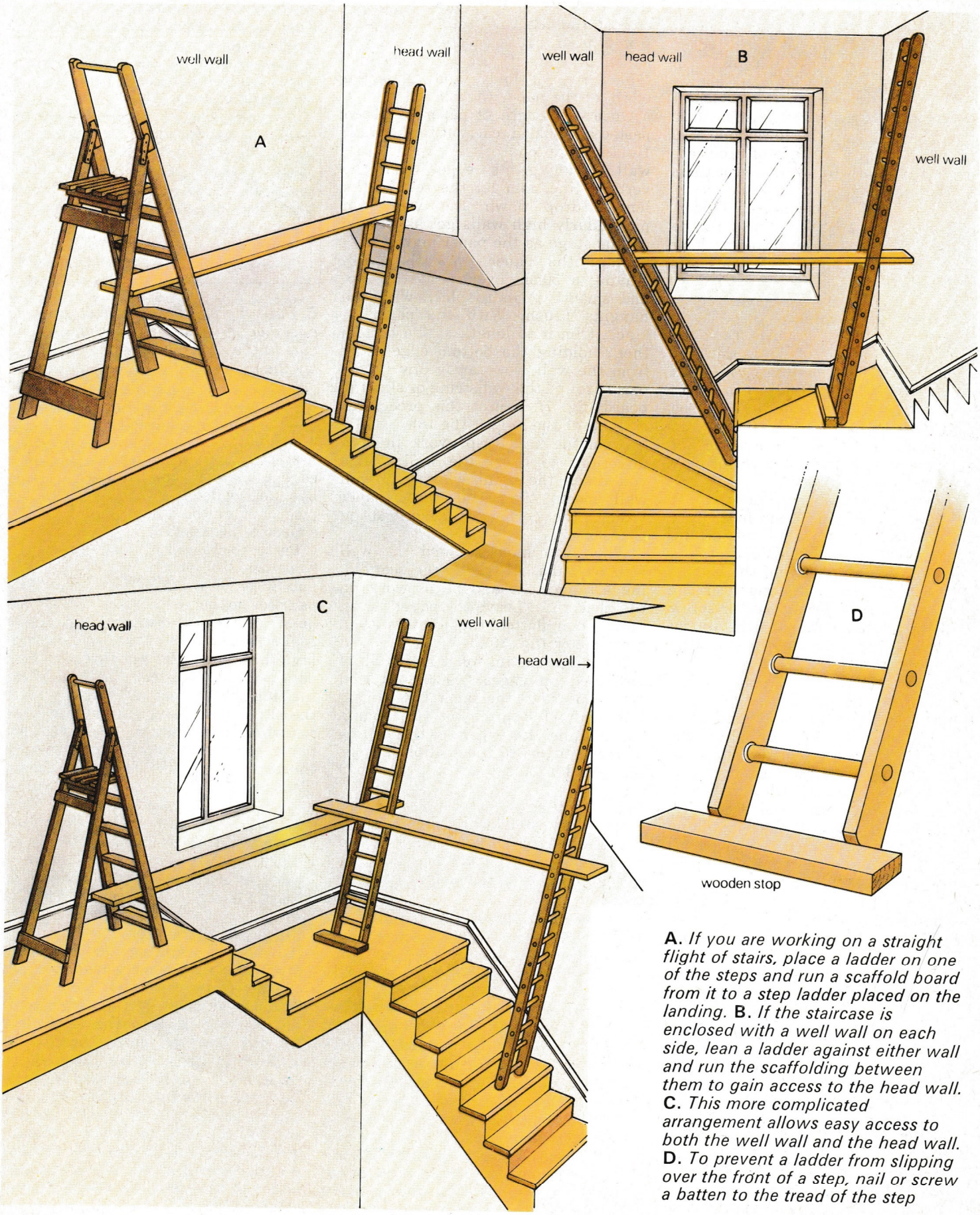
Access platforms

Due to the height of the stairwell it is essential to erect a safe and secure platform, giving you easy access to the walls, before you start work. The arrangement of ladders and boards depends on the type of staircase involved, but you will need at least two ladders and one scaffold board.

Make sure that all ladders to be used are sound and, with step ladders, check that the hinges are secure and that the ropes which hold the legs together are not worn or frayed. Before erecting the platform, take up the stair carpet, if fitted, and check for any weakness in the staircase—such as a loose tread—that could result in an accident. Repairs to wooden staircases are covered on pages 328-333.

Single-flight stairs

If you are working on a straight flight of stairs, place a ladder on one of the steps with its foot resting against the riser of the step and its top leaning against the head wall. Do not lean the ladder against the wall at an angle of less than 45°, or its stability will be seriously impaired. To give protection to the wall, you can tie pieces of cloth around each leg at the top of the ladder. Place a step ladder, with its legs fully extended on the landing at the top of the flight and run the scaffold board between the two (fig. A).



A. *If you are working on a straight flight of stairs, place a ladder on one of the steps and run a scaffold board from it to a step ladder placed on the landing.* **B.** *If the staircase is enclosed with a well wall on each side, lean a ladder against either wall and run the scaffolding between them to gain access to the head wall.* **C.** *This more complicated arrangement allows easy access to both the well wall and the head wall.* **D.** *To prevent a ladder from slipping over the front of a step, nail or screw a batten to the tread of the step*

Hayward Art Group

If the unsupported length of the scaffold board is more than 1.5m, it is advisable to place a further board on top of it to lend extra strength. In this case, be sure to lash the boards with some thin rope to the ladder at either end, to prevent the top board from slipping over the lower one. Tie the ropes behind the face of each ladder so that you will not trip over them as you move along the scaffold.

If you do not have a step ladder, you can place a packing case on the landing to support the board as long as its unsupported length does not exceed 1.5m.

Double-flight stairs

Where a staircase doubles back on itself at an angle of 180°, there is often a landing between the two flights and the scaffolding arrangement for single flight of stairs can be employed. But sometimes the bend in the stairs is formed by a series of triangular steps and there is nowhere to place a step ladder.

In this case, lean a ladder against the wall at the top of the first flight with its foot resting on one of the steps, again at an angle of not less than 45°. Then, to prevent the bottom of the ladder from slipping over the front of the step, firmly nail or screw a small wooden batten to the top of the step and prop the foot of the ladder against it (fig. D).

The head wall

When you come to paper the head wall, you will have to alter the scaffolding arrangement so that no ladders are leaning against it. If the staircase is enclosed with a well wall on either side, lean a ladder against each of these and run the scaffolding between the two (fig. B). Fix a batten into place to support the foot of the ladder that leans with the slope of the stairs. The other ladder rests against the riser and is thus prevented from slipping.

Where there are banisters on one side of the staircase and the handrail is sturdy enough, you can lash the scaffold board to the top of it. A safer method is to erect a scaffolding arrangement as shown in fig. C.

Papering the stairwell

When a suitable scaffolding arrangement has been erected, you can start to paper. Begin by dropping a plumbline where the edge of the longest length of paper will fall and mark a vertical line down the well wall. Cut a length of paper about 100mm longer than required and, starting from one end of the length, paste it working from the centre outwards. Fold the paper over itself into a concertina-type series of folds, and align the edges of the paper (fig. 2).

Once the length of paper has been pasted and folded, carry it to the wall. Hold the top end of the paper to the wall, aligning its edge with the vertical line, and let the rest of the length drop down the wall. On particularly high walls get assistance at this stage as the paper may tear.

Place the paper onto the wall, leaving a 50mm overlap at the top, and smooth it in to place with the hanging brush. With the paper in place, trim it to length at the bottom then, holding the bottom edge away from the wall, wipe away any excess paste around the wallstring or skirting board (fig. 7). Repeat this process at the top of the length (fig. 8).

From the first strip, work in both directions to cover the wall. When you reach the point where the well wall meets the head wall, paper around the corner as described on pages 82-87.

When you have papered the well wall or walls, rearrange the scaffolding arrangement and begin work on the head wall. Leave the paper for an hour, then flatten the joints with a seam roller (fig. 10).

Paper the ceiling of a stairwell as described on pages 200-204, so that the strips lie in the same direction as the scaffold board you are using. Never hang the paper on the ceiling at right angles to the scaffold as this may result in a fall.

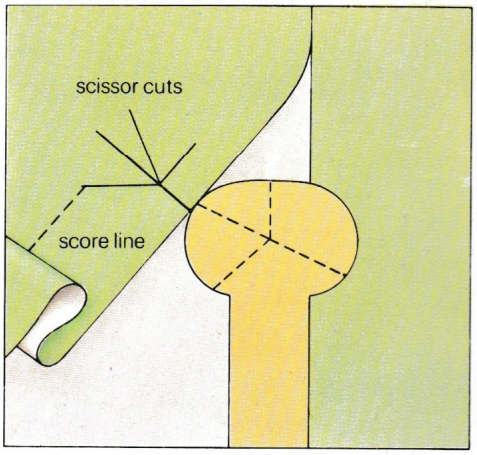
Wall handrails

Papering a well wall is sometimes complicated by a handrail attached to the wall. But as wall handrails do not form part of the main structure of a staircase and are screwed directly to the wall, they can usually be removed without difficulty.

As you paper over the screw holes of the removed handrail, press the paper firmly against them. With the paper in place, make small pin pricks through into each screw hole so that you can locate the holes later and refit the handrail.

Papering around banisters

On a double-flight staircase, there is often a banister attached to the wall at the point where the stairs turn or at the top of the flight of stairs. In this case, as the post cannot be removed without affecting the structure, you will have to paper around it.

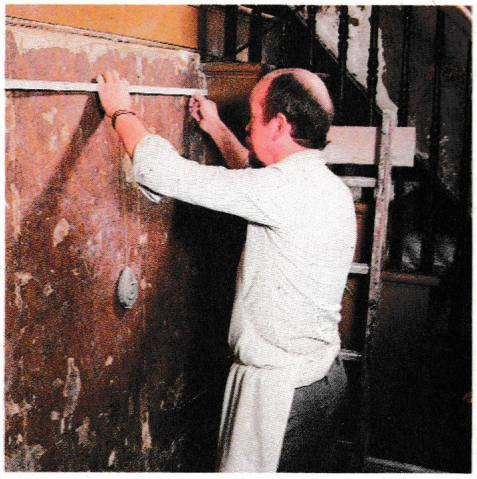


E. *Papering around a banister. Hang one sheet against the banister, make cuts in the next piece as shown, then lay the paper gently into place*

The wall is usually highest at this point, but even if it is not, hang your first strip of paper here so that its edge is against the banister. If the banister widens at the top, cut a piece out of the paper to accept the shape of the wood.

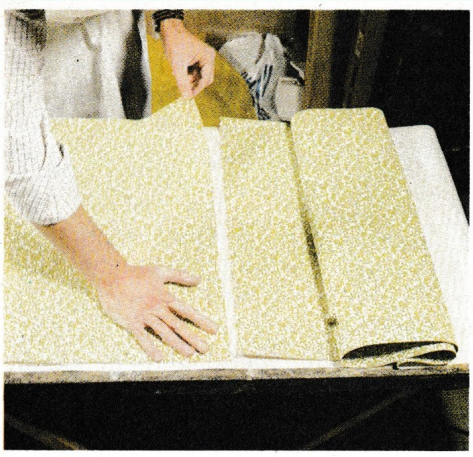
Paste the adjacent strip of paper, again starting at the top of the wall, and when it reaches the top of the banister make a diagonal cut 40mm below the top as shown in fig. E. Make two further cuts as shown and lay the paper lightly around the edges of the banister.

Using the back of the shears, score the paper down the edge of the banister where it meets the wall. Lift the paper away from the wall, cut along the score line and brush it back into place around the banister.

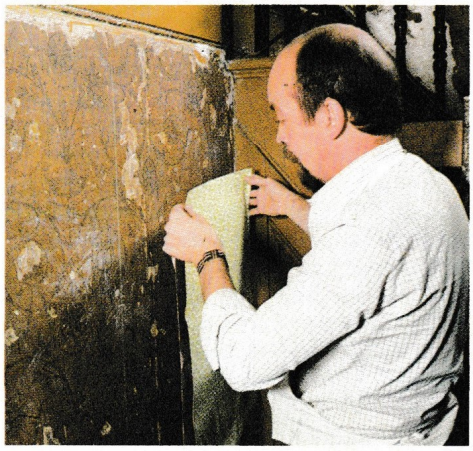


Gavin Cochrane

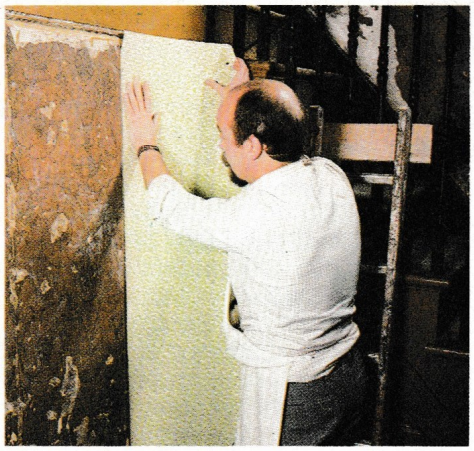
1 *Drop a plumbline where the edge of the longest length of paper will fall. Draw a vertical line down the wall at this point*



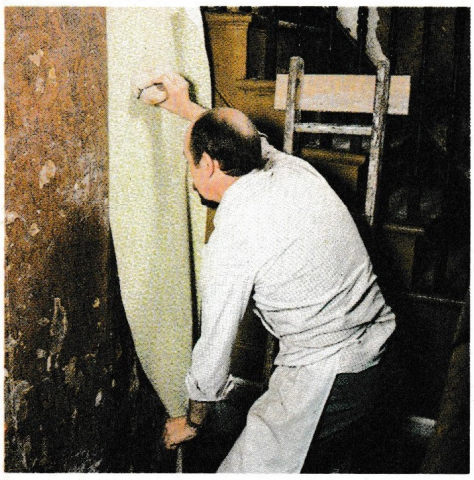
2 *Paste the paper, working from the centre outwards, then fold it over itself into a concertina-type series of folds*



3 *Once the length of paper has been pasted and folded, take it to the wall. Align its edge with the line on the wall*



4 *Let the remaining paper drop down the wall, keeping its edge to the vertical line, and press the top edge firmly into place*

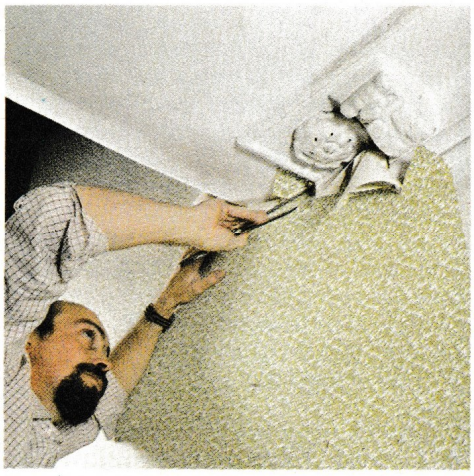


5 *Use the hanging brush to smooth the paper downwards and outwards, making sure you are positioned safely on the platform*

6 *When the paper comes into contact with a corner or skirting, leave a guideline for trimming by scoring with the back of the shears*

7 *Pull the paper away from the wall and cut off the waste areas along the guideline. Wipe excess paste away from skirtings*

8 *To prevent paste from getting on to the ceiling, fold the top edge of the paper back, wipe off excess paste and trim*



9 *Where you meet obstacles such as mouldings on the ceiling, again make a guidline with the shears, then trim the waste*

10 *Leave the paper for about an hour to allow the paste to dry, then smooth and flatten the seams with a seam roller*

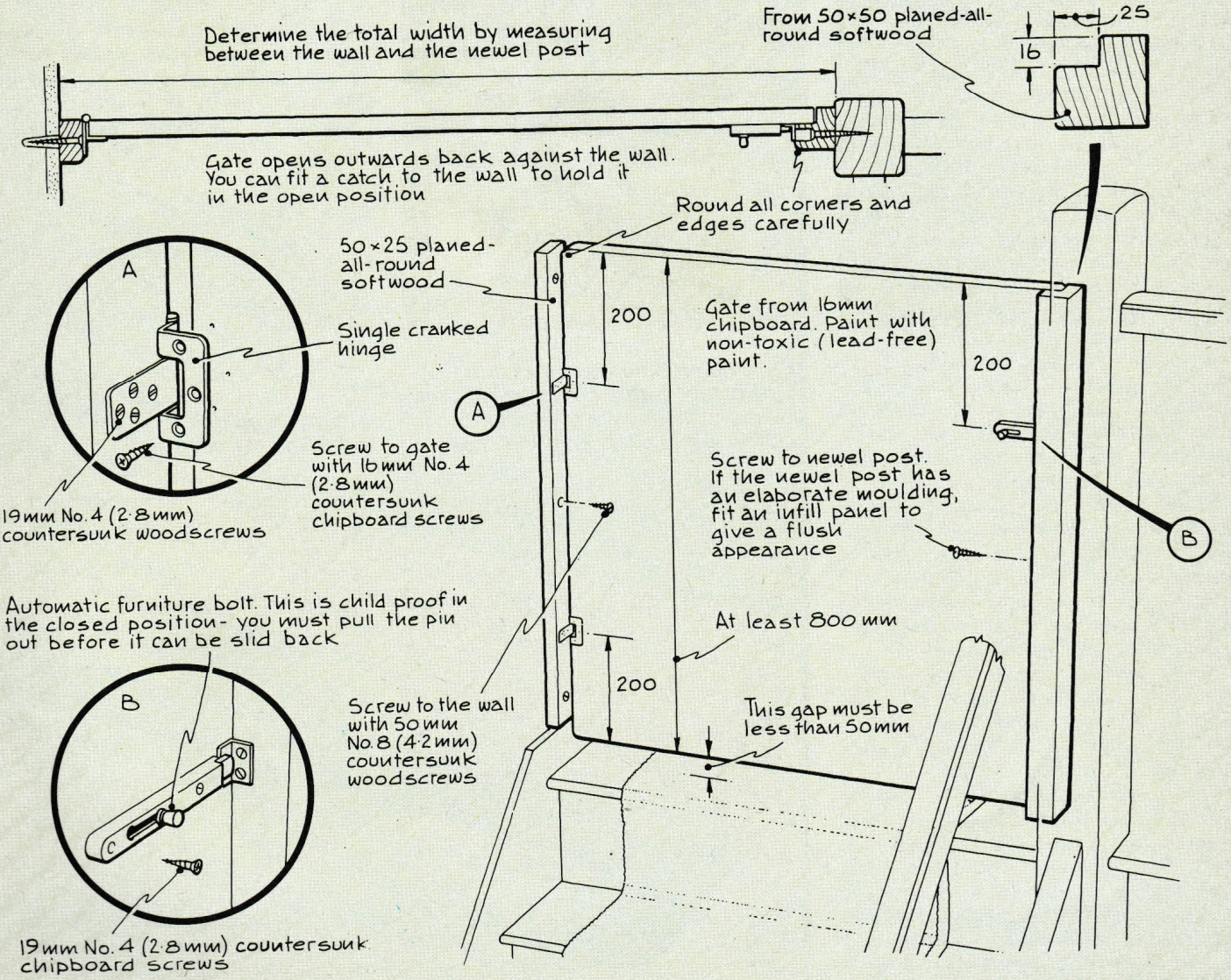
Gavin Cochrane

A child safety gate

Falls cause as many injuries in the home as all other accidents put together—and young children are particularly at risk. One way of cutting down the risks is to fit a gate at the top of the stairs preventing children access to a potentially dangerous area.

This gate is designed to do just that. It has a special child-proof bolt which can easily be opened by an adult, but not by small fingers. Equally importantly, there are no holes or sharp edges on which a child can injure itself. It is worth fitting a gate to both top and bottom of the stairs if the children use both floors. The gate opens back against the wall, and if desired, you can fit a clip to hold it back.

Construction is extremely simple, and the materials cost very little. You should measure your stairs for the exact width, but keep as far as possible to the height and distance from the floor shown in the plans. Round all edges thoroughly and sand smooth before painting with a non-toxic paint.


Determine the total width by measuring between the wall and the newel post
From 50×50 planed-all-round softwood
25
16
Gate opens outwards back against the wall. You can fit a catch to the wall to hold it in the open position
Round all corners and edges carefully
A
50×25 planed-all-round softwood
Single cranked hinge
Screw to gate with 16mm No. 4 (2·8mm) countersunk chipboard screws
19mm No. 4 (2·8mm) countersunk woodscrews
200
Gate from 16mm chipboard. Paint with non-toxic (lead-free) paint.
200
Screw to newel post. If the newel post has an elaborate moulding, fit an infill panel to give a flush appearance
B
Automatic furniture bolt. This is child proof in the closed position - you must pull the pin out before it can be slid back
At least 800mm
200
Screw to the wall with 50mm No. 8 (4·2mm) countersunk woodscrews
This gap must be less than 50mm
B
19mm No. 4 (2·8mm) countersunk chipboard screws

Advertising Arts

The drains underground

● Drainage systems explained ● Old drains and new extensions ● Choice of materials for drains ● Methods of pipe joining ● Planning drains for new extensions ● Drains and the law ● How to clear blocked drains

The majority of blockages in drains are caused by the misuse of the wc —there is a limit to what can be disposed of in this way. But blockages occur for a variety of other reasons. Knowing why and where these occur enables you to clear and otherwise maintain the drain system that serves your home.

Drainage systems

Although everyone is familiar with gullies and manhole covers—obvious surface signs of underground drainage —the relationship between the two may not be clear.

Foul water is the discharge from wc pans, basins, baths and sinks. Surface water is rainwater from roofs, paths and paved areas. In a *separate drains system*, foul discharge and surface water each have separate underground drains leading to separate sewers (fig. A). In a *combined drains system*, foul and surface water are discharged to a common or combined drain system that in turn discharges to a combined public sewer (fig. C).

A third drainage variation is the *partially combined system* in which it is possible to discharge some rainwater from the roofs into the soil stack, though local authority permission must always be obtained.

Though the type of above-ground drainage you have has quite a large say in the type of drainage featured beneath ground level, it is the type of existing public sewerage system which finally determines what is used in a private drainage installation.

Some councils insist that surface water—specifically rainwater from the roof—is drained to a *soakaway*, a rubble-filled pit a little beneath ground level (fig. J).

Where no mains drainage can be laid on—still common in the case of isolated properties—foul water can drain to a *cesspool* (fig. I) or *septic tank* (fig. H) away from the house. Building regulations insist that these are located so as not to present any hazard to health. They are covered in detail further on in the course.

Drains and extensions

The one time you need to give more than the usual amount of thought to underground drainage is if you are planning to build an extension to your home. As always where health matters are concerned, strict regulations apply. These vary slightly from place to place, so check the precise details with your local authority before undertaking any work.

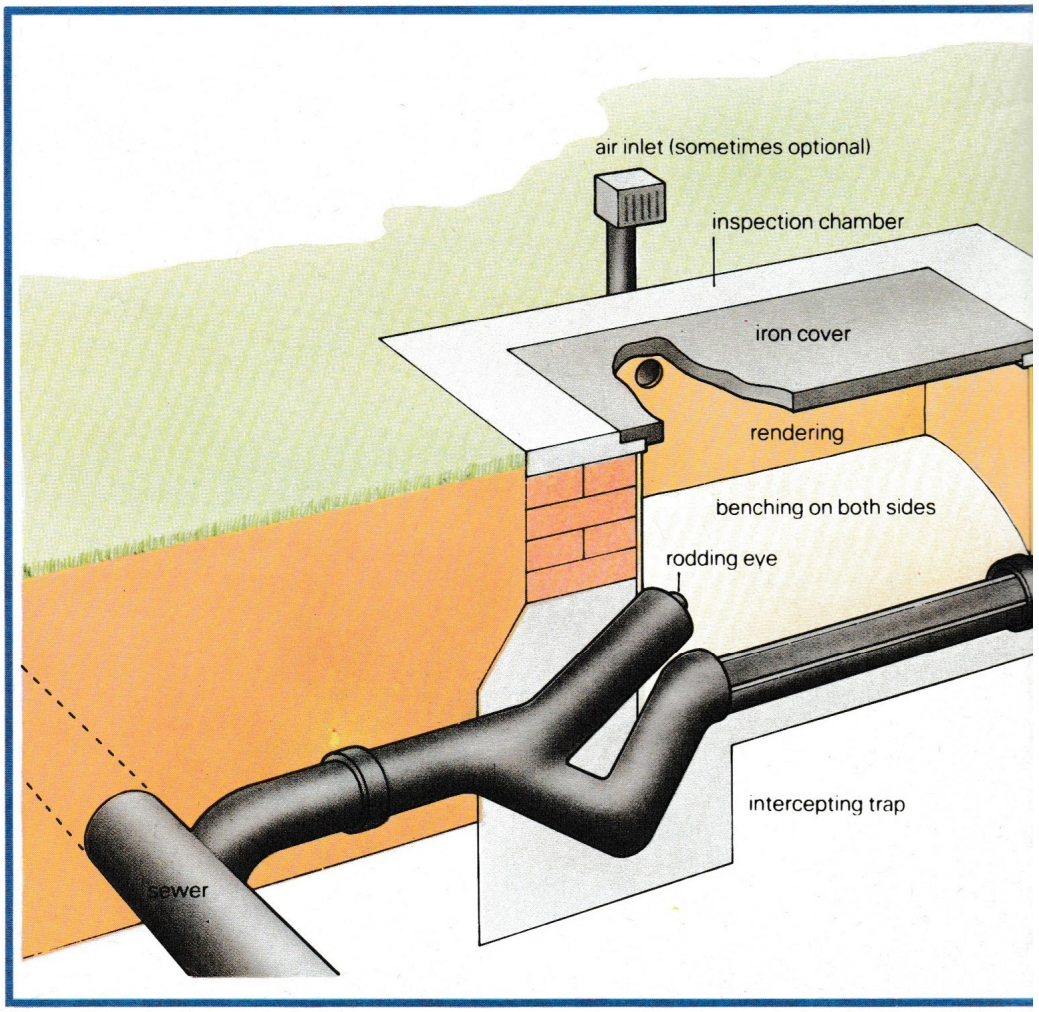
Any pipework covered by the new building must be encased in a concrete sleeve with a minimum thickness of about 100mm. This protects the pipe from the effects of ground subsidence or compression which may or may not result from the building above.

If the extension is built over an inspection chamber, the old cover needs to be replaced by a double-seal type. A coating of thick grease along the flange ensures that no smells will enter the new room. Under no circumstances lay a permanent floor over the inspection chamber as access for rodding must always be provided.

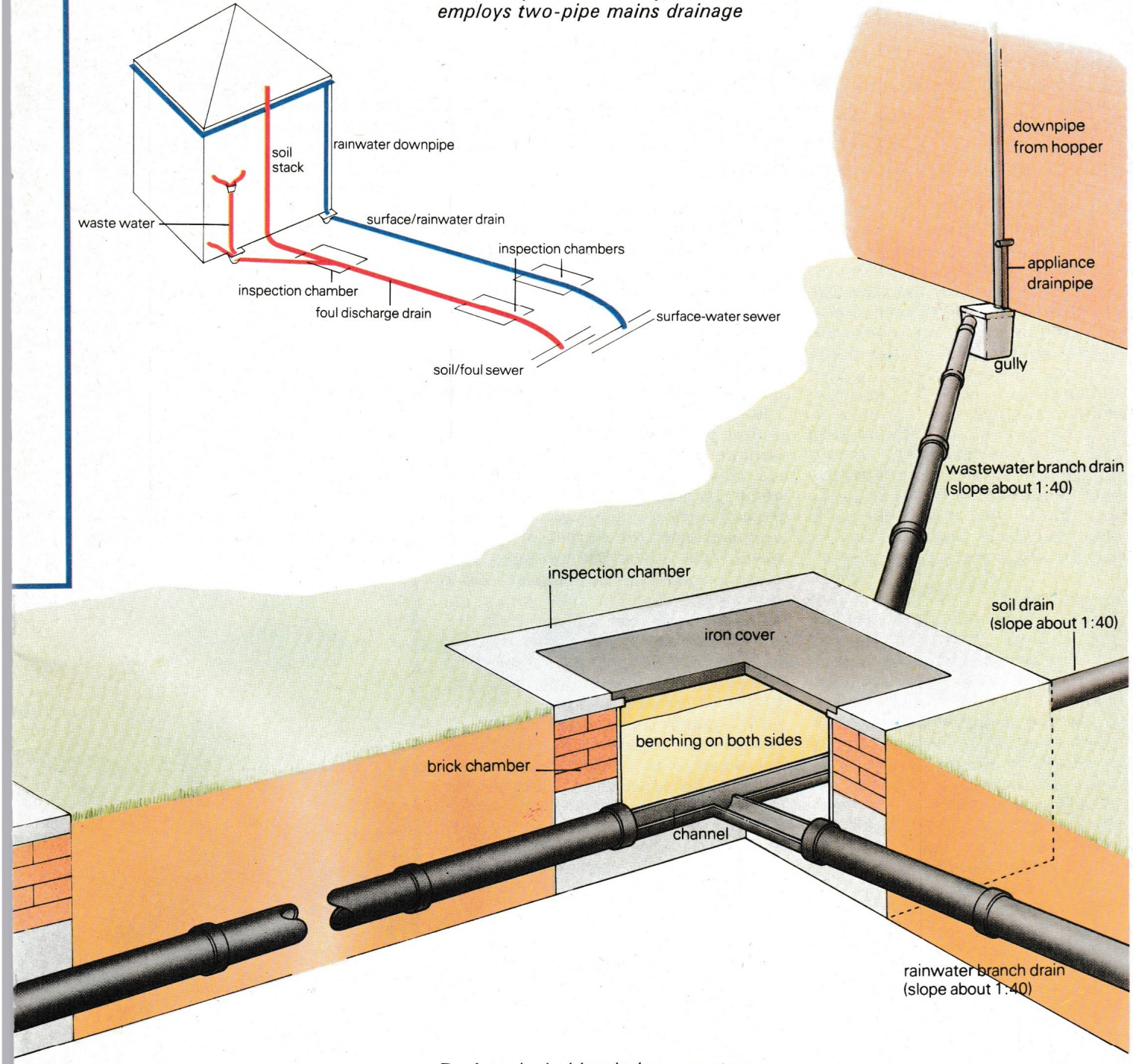
If the extension calls for additional plumbing and drainage—such as that required for a bathroom or lavatory—building costs rise significantly if use cannot be made of existing facilities. This is particularly true if a new inspection chamber and drain has to be provided (fig. F), though the commonest problem usually involves repositioning rain and wastewater gullies.

In houses using a two-pipe above-ground drainage system, it is not difficult to build the extension against the soil pipe and disguise this in the finishing stages. But otherwise you must restrict the width of the extension to the distance between the rainwater and wastewater gullies.

Single-stack above-ground systems present less of a problem and providing you avoid the back-inlet gully at the



A. *The separate drains system employs two-pipe mains drainage*



B. *A typical older drainage system making use of brick-built inspection chambers. The standard chamber (nearest to the house) is tailor-made for the number of original inlets and can be difficult to break into. Cracked benching and rendering can cause blockages, and repairs to both these may be necessary from time to time. The intercepting chamber employs a trap to prevent sewer smells rising up the system*

Terry Allen Designs

base of the rainwater downpipe (fig. G), there are few design restrictions. You may, however, prefer to build the extension flush to the side wall. In the example shown in fig. G, this means relocating the gully and its accompanying rainwater downpipe around the corner.

Normally, rainwater downpipes need not influence the design of an extension too greatly. If these cannot be relocated at a more convenient point along the gutter, redirecting them around the edge of the new building—to perhaps combine with new guttering—is not a difficult or expensive job if plastics piping is used.

If the new extension requires drainage of roofwater alone, try to arrange the gutter system so that the down pipe can be led to an existing gully. If the extension calls for separate foul-water drainage and a separate stack, it still may be more convenient to lead the new downpipe to an existing gully rather than involve yourself in additional trench digging and pipe laying. But if possible use a partially combined drain system to simplify the above-ground pipework.

Drain materials

New installations and alterations to existing systems must not proceed without the permission of the local authority, who can stipulate the materials to be used and amend details in the design. Requirements vary from area to area and you must rigidly adhere to all local bye-laws.

Several different materials can be used in a drainage system. Pre-formed concrete, stoneware and plastics components take the hard work out of constructing inspection chambers and these should be used whenever possible to lessen the chances of mistakes in building.

The choice of material for pipework should be based on the type of effluent to be handled and the chemical and physical nature of the ground through which it passes. Vitrified clayware pipe—sometimes called 'stoneware'—is widely used because of its strength and low cost but is weak at the joints.

In situations where ground movement is expected, straight-ended pipe lengths can be joined with a flexible joint consisting of a polypropylene sleeve (fig. K). Otherwise the traditional spigot and socket piping can be used. Joints are made using 1:1 mortar and an inner seal of tarred gaskin (fig. K). Pipe in various lengths and diameters is available, as are bends, junctions and taper pieces to match the more commonly-used sizes.

Cast or spun-iron pipes are used where greater strength is required though these suffer greatly from acid wastes and in soil conditions where corrosion may occur. A bitumen coating must be applied to all surfaces and special care must be taken to ensure that this remains intact during pipe laying. The pipes are joined by filling the spigot socket with caulked lead and an inner seal of tarred hemp, known as gaskin (fig. L).

Much more popular now are the asbestos-cement, pitch-fibre and PVC piping forms, the latter particularly suited to DIY work. Asbestos-cement pipes, which must be laid on a bed of concrete, are sealed and joined using a sleeve of the same material in conjunction with a rubber 'O' ring arrangement (fig. P).

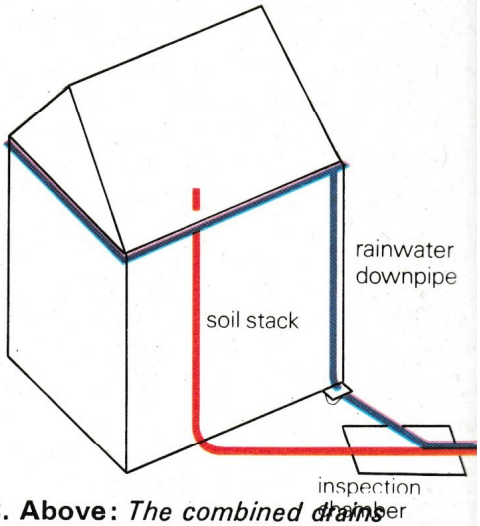
Pitch-fibre and PVC pipes can withstand considerable directional strain without rupturing, so are usually laid directly on a suitable ground bed. Pitch-fibre pipe is tapered slightly at each end. A join is made by ramming this end into a tapered coupling sleeve, and normally no additional jointing compound is necessary for a sound joint (fig. O). PVC joints are sealed by a system of neoprene 'O' rings within the spigot socket (fig. N). Push-on joints such as this speed up assembly procedures and permit slight movement without leaking.

PVC piping—an unplasticized form with thicker walling is normally used for underground drainage—is normally quite suitable for most extensions and as a replacement for a domestic set-up. But not all authorities permit its use in this manner: this and other factors may prompt you to choose one of the other forms of piping.

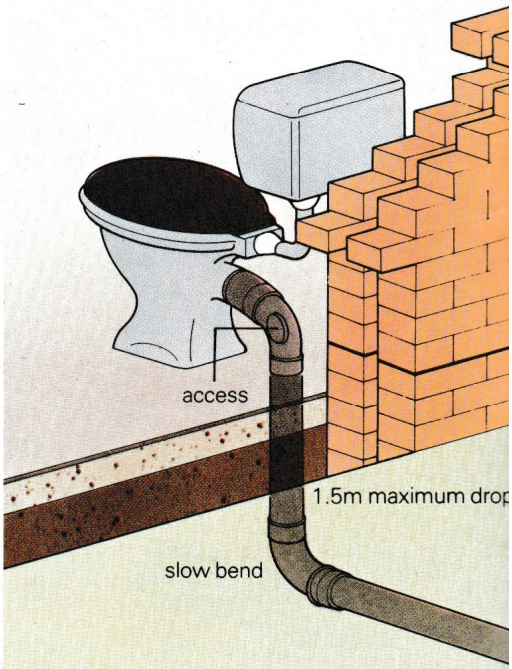
Planning new drains

The layout of drainage should be as simple as possible and the runs as short as possible—this reduces costs and minimizes the effort of laying.

Obviously, pipes should be laid in straight lines from the building. If a change of direction cannot be avoided and the angle exceeds 45°, two bends (fittings) should be used. All junctions should be oblique and the contained angle not more than 45° (fig. F). Laying a drain under the new building should be avoided unless it is otherwise impossible to get a sufficient fall, or if too much additional pipework then becomes necessary. But do bear in mind the importance of casing this pipework in

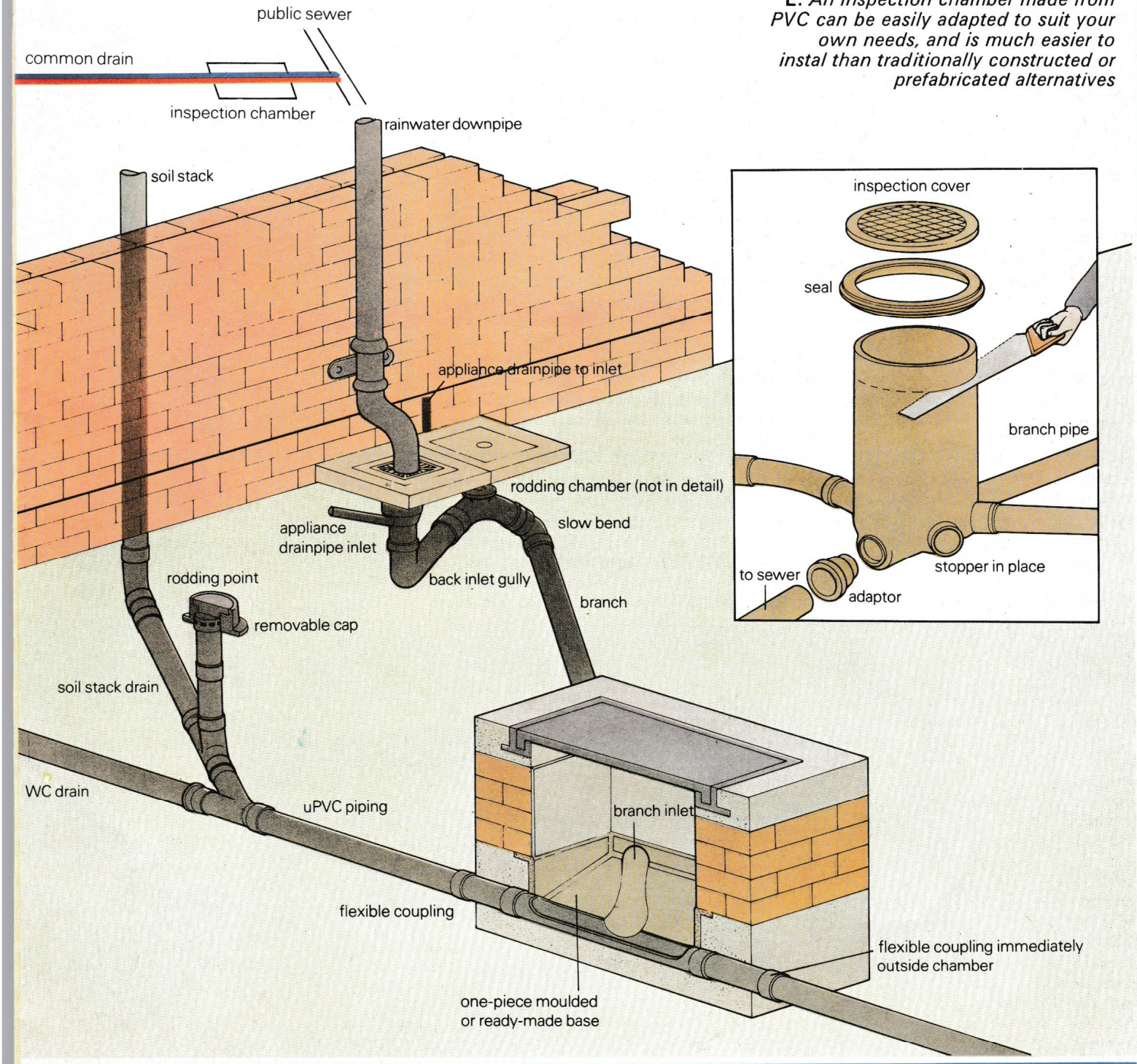


C. Above: *The combined drains system*



D. Below: *A modern drain system is likely to make considerable use of prefabricated components and rodding points in place of the traditional inspection chambers, which still need to be provided where ever there is likelihood of a blockage—such as a pipe junction. The use of PVC piping simplifies connections. Groundfloor appliances such as a wc can be connected directly to the drain providing the fall to the latter is no more than 1.5m. Other appliances can be connected to a back-inlet gully. Remaining household waste is discharged through the soil stack*

E. *An inspection chamber made from PVC can be easily adapted to suit your own needs, and is much easier to instal than traditionally constructed or prefabricated alternatives*



Terry Allen Designs

a concrete sleeve.

A pipe diameter of 110mm is normally sufficient for domestic purposes and should be used for the soil stack connection. This should be laid at a gradient of at least 1:70 (about 1°). Where the rate of flow is likely to be small—such as can be expected in a pipe length connecting a gully trap with the inspection chamber—the gradient should be steepened slightly to at least 1:40 (about 1.5°)—the standard for older premises using the old, 4″ pipe width. Avoid too steep a gradient as this will cause rapid water run-off: solids left behind will then cause blockage.

Suitable access points must be provided for maintaining and testing the system you instal. Rodding eyes, access gullies, inspection chambers or manholes can all be used (fig. E). The traditional distinction between an inspection chamber and a manhole is that the latter is a deeper chamber, large enough for a person to climb down and into for the purposes of clearing blockages.

In a PVC system, you can incorporate rodding points or access bowls instead of costly inspection chambers (fig. D). But these rodding points cannot be used for inspecting flow, so it is usual to include at least one inspection chamber in the system.

It is important to provide access to any point where a blockage might occur (fig. D), including bends of 45° or more, junctions where the contained angle is more than 45° and junctions where cleaning is not otherwise possible.

Severe changes of gradient in a pipework run create lips which may cause build up of deposits and eventual blockage. Access must therefore be provided at backdrops and ramps. Other access points should be within 12m of the connection of drain and sewer and at the head of each length of drain.

For good drainage, it is essential to maintain a pressure equilibrium between the inside and the outside of the system. This is done by providing ventilation pipes along the system. Branches over 6m in length require a vent pipe.

Intercepting traps, although included in some drain systems (fig. B), should be avoided as they inhibit the effective ventilation of the drain. Recent evidence suggests that they may also cause blockages.

Nevertheless, they should be used when new connections are made to an old, fully intercepted sewer and where the drainage system is connected to a cesspool. Also, some local authorities insist on the use of intercepting traps.

Drains and the law

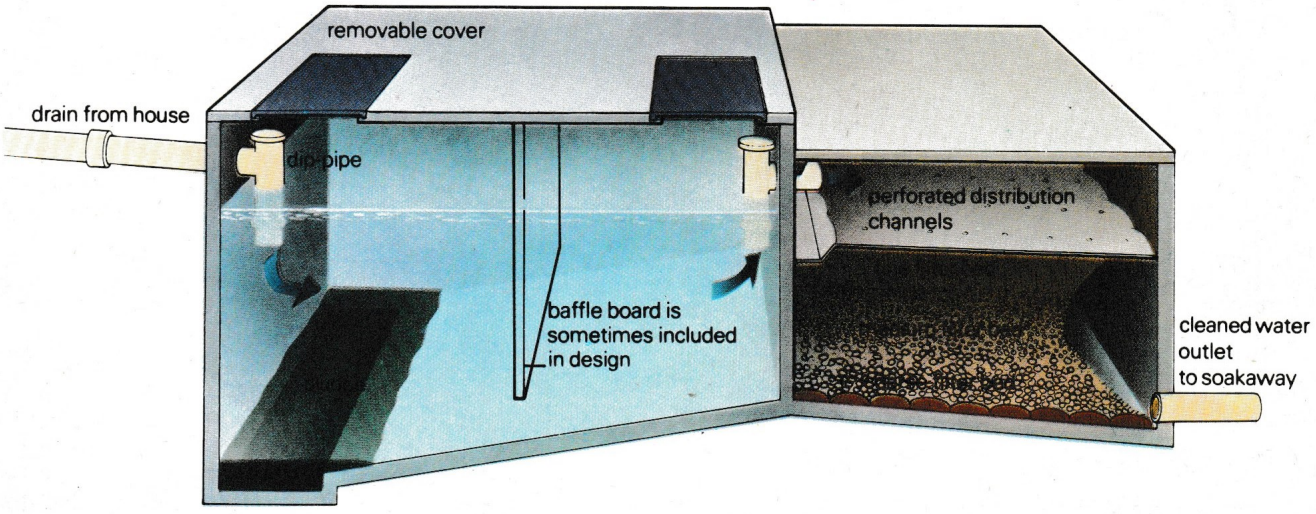
In the UK, a house owner is responsible for maintaining a drain up to the point where this joins the main sewer, including the length under the pavement or road beyond the property limits.

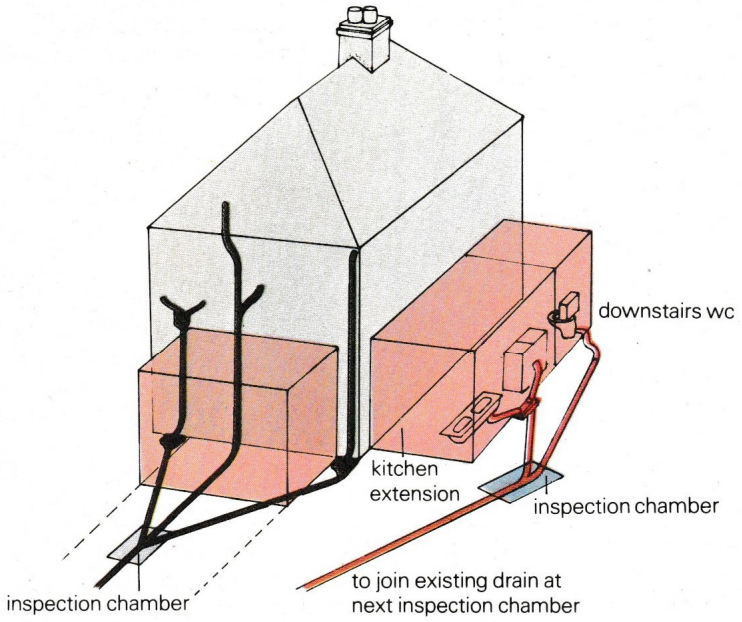
Where a drain is shared by several houses, the legal position is a little more complicated. This needs to be sorted out well before costs are divided.

A shared drain built before October 1937 is described as a *public sewer*. The local council is responsible for clearing and maintaining this but costs of repairs are usually divided between those households served by the drain.

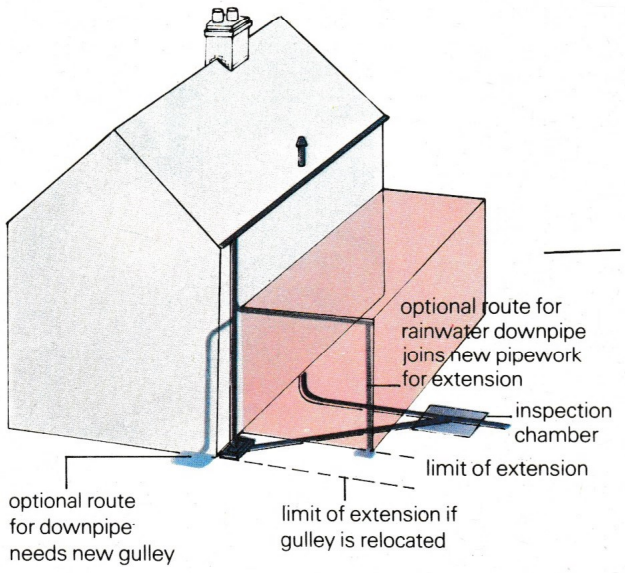
Shared drains built after that 1937 date are regarded as *private sewers*. All costs of repairs, clearing and maintenance have to be shared between the house owners involved, You need contribute costs only for parts of the drain actually used by your house. Branch drains from each house to the main flow are the individual householder's responsibility. It is only these that can be altered and replaced—and the local authority has tight control on what can, and cannot, be done.

H. *A two-chamber septic tank. Drain water enters at one end and remains within the system for a while, during which time bacteriological action breaks down the effluent into relatively harmless components. Initially, solid matter collects to form sludge (which can be pumped out from time to time). The liquid then passes into the second chamber where further bacteriological action purifies the water from the first chamber. This is then discharged into the soil or into a suitable ditch*

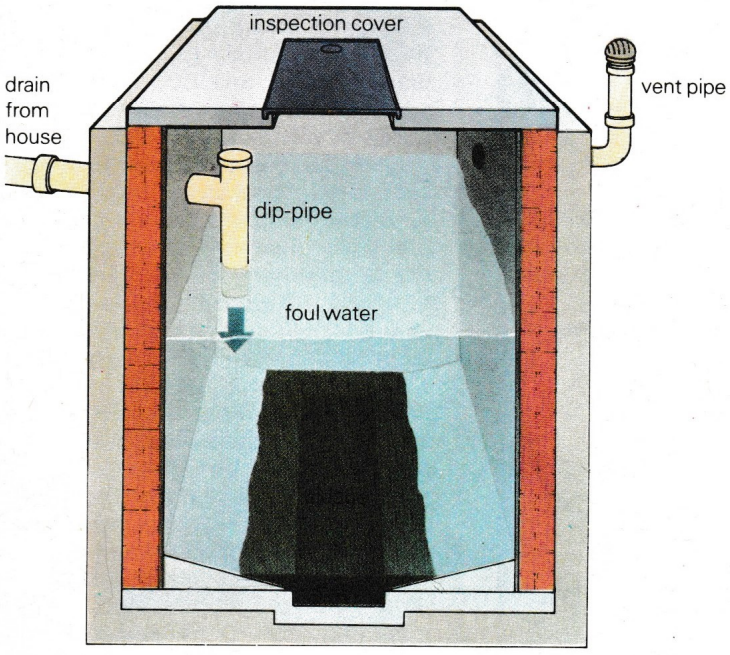




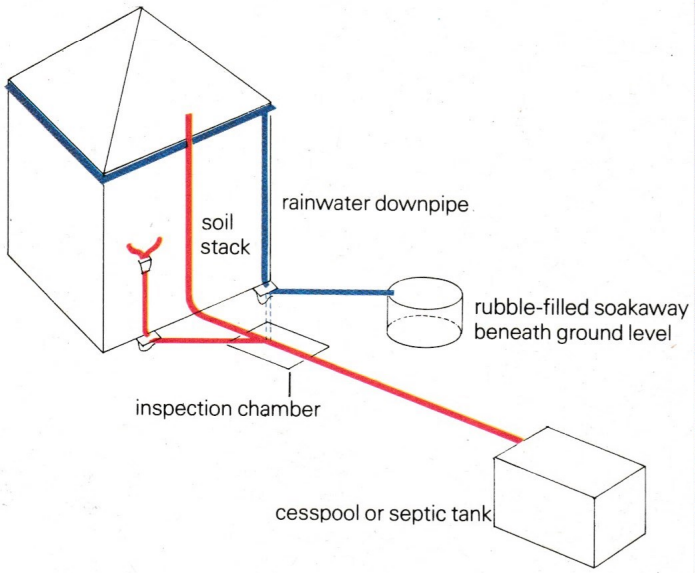
F. *Drains may impose certain restrictions on the design of home extensions. Hopper and rainwater downpipes are the major problem unless their gullies can be relocated. If the extension covers the inspection chamber, a double seal must be used and underground piping must be sleeved in concrete. New runs should be kept as short as possible and sharp bends must be avoided.*


optional route for rainwater downpipe joins new pipework for extension
inspection chamber
limit of extension
optional route for downpipe needs new gulley
limit of extension if gulley is relocated

G. *Usually the biggest problem with an extension to a modern home is avoiding the rainwater downpipe. Unless the gully for this can be relocated, the extension is restricted to that shown*



I. *A brick-built cesspool, which requires frequent emptying. Old cesspools are prone to leaking, so occasional inspection for damage is advisable*



J. *Where mains drainage is not available, the house drains can be connected to a septic tank or cesspool. Rainwater is usually directed to a rubble-filled soakaway under these conditions, but may be connected to the household drain*

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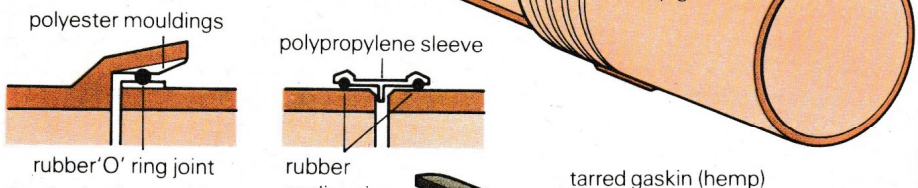
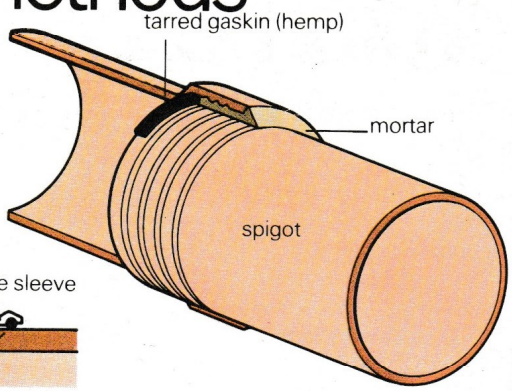
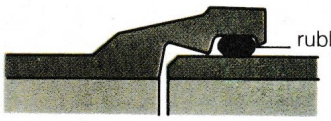
Pipe joining methods

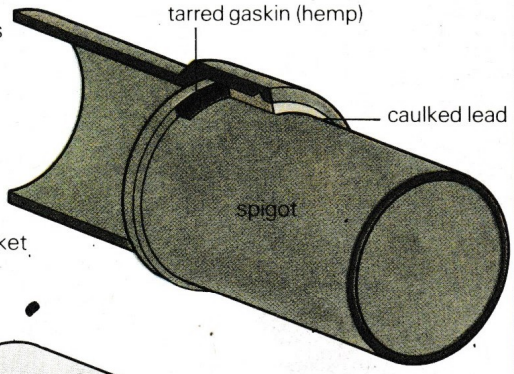
K. *Methods for joining stoneware pipe range from the traditional spigot joint to the newer systems using polypropylene sleeves and 'O' rings (below)*



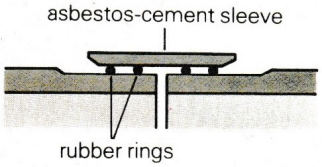


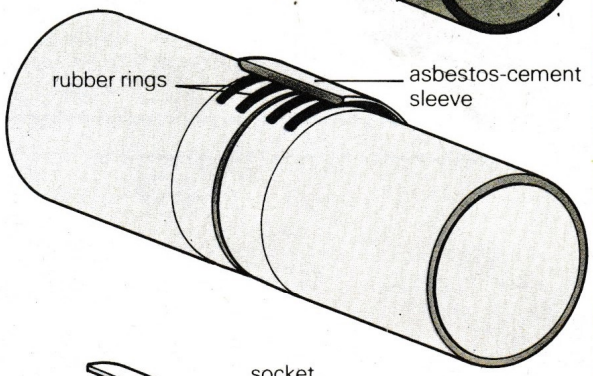
L. *A similar method is employed for joining cast-iron pipe but caulked lead is used: A modern system uses a rubber gasket (below)*





M. *Asbestos cement piping is joined by using connecting sleeves which employ an internal seal (shown in profile below)*

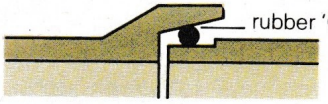


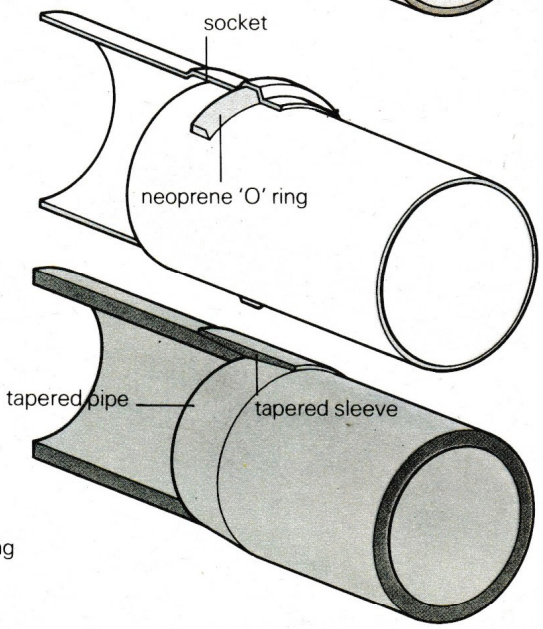


N. *PVC pipe sockets into place and normally the joint is left flexible to take up any settling which may occur when the pipe is eventually buried*

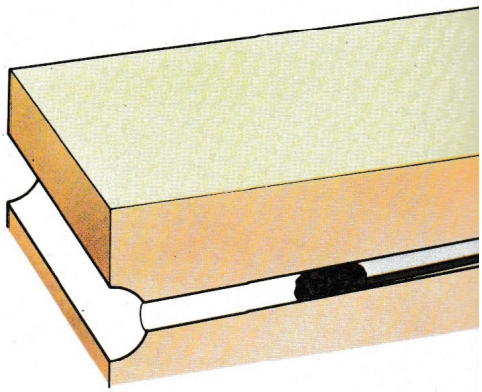
O. *Pitch-fibre pipe ends are tapered and are connected using a tapered sleeve*

P. *Concrete pipe (below) can be joined using a flexible sleeve arrangement incorporating a rubber 'O' ring*





Rodding the drains



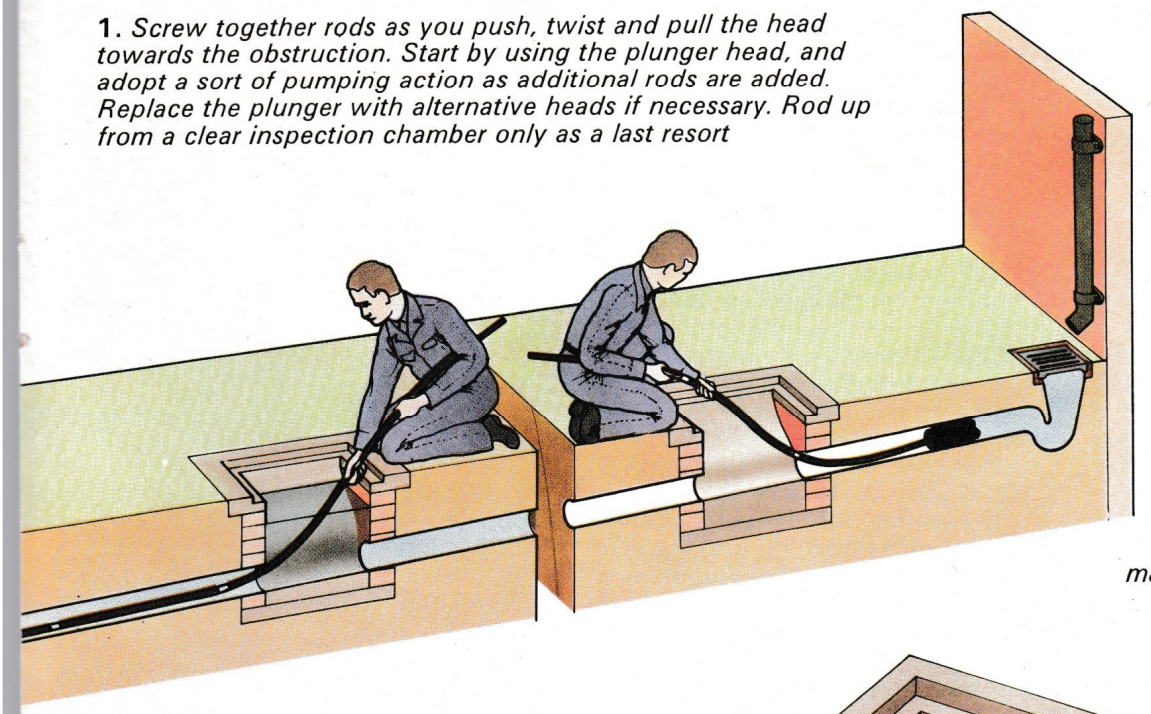
Clearing blocked drains is an unpleasant but necessary job facing any householder whose responsibilities include drain maintenance. Usually the first sign of trouble is a downstairs sink or wc pan which fails to drain completely, though occasionally an overflowing inspection chamber is the tell-tale sign of a blockage.

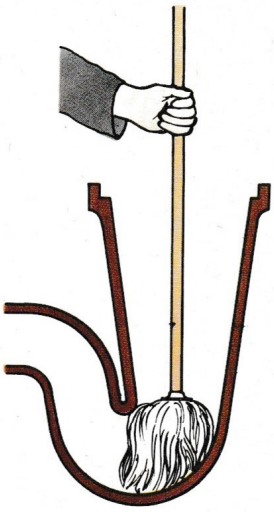
Locating the blockage is a process of elimination. If only the one appliance is blocked on the ground floor, the blockage is likely to be in the branch drain that serves it—typically this will be a wc as ground floor appliances often feed directly to a gully. If a gully is blocked, overspill will be readily noticeable and the appliance discharge pipes leading to this can be presumed to be free of obstruction.

A leaking inspection cover suggests that the blockage is on the sewer side of the chamber. An empty chamber points to a blockage in the length of drain joining the gully (or directly connected wc) to the inspection chamber. Carefully lift the inspection cover when you come to check.

In either case, it is unlikely that gentle poking with a stick can do

1. *Screw together rods as you push, twist and pull the head towards the obstruction. Start by using the plunger head, and adopt a sort of pumping action as additional rods are added. Replace the plunger with alternative heads if necessary. Rod up from a clear inspection chamber only as a last resort*





2. *Open gullies require some maintenance—remove leaves and accumulated solids, and use a mop to remove all water. Then scrape gully walls using hot water and washing soda*

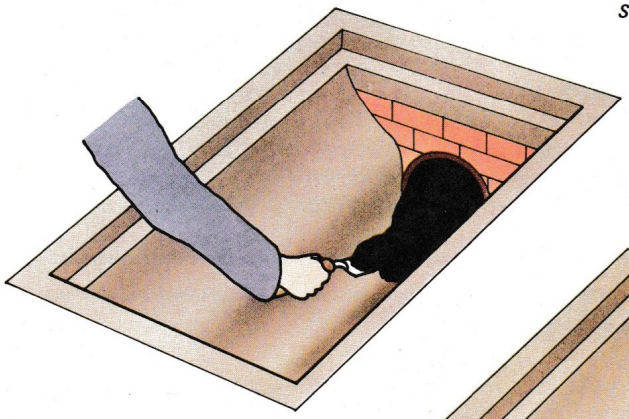
much to remove the blockage, and you will need to buy or hire a set of drain rods for the job. These are made of rattan cane or polypropylene in section lengths of about 900mm and are screwed together, sometimes with a lockfast arrangement to prevent loss.

The accessories available for this form the business end of the tool, and include a rubber plunger (for general purpose work), a drop scraper (for scouring the sediment that caused the blockage initially), a brush, a double worm screw and a cleaning wheel.

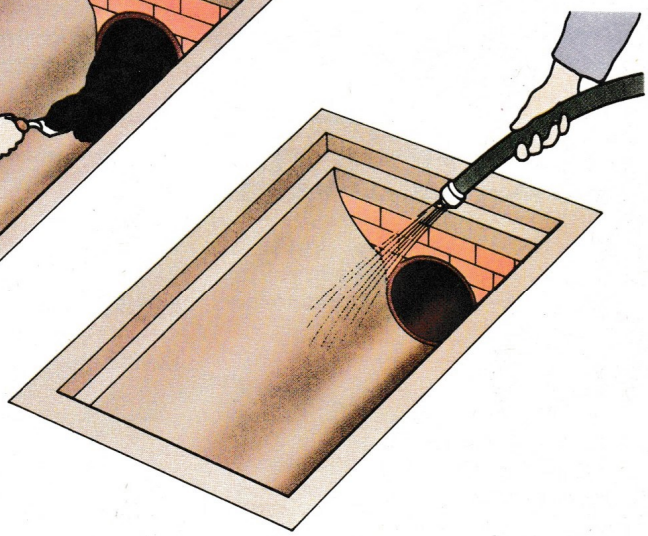
If clearing uphill, place a board across the exit pipe of the chamber so that when the blockage is cleared the debris that caused it can be removed before it enters the remaining part of the drain system.

When clearing downhill, typically when dealing with a blockage below the inspection chamber nearest the main sewer, grip the rods strongly as the drain suction—evident when the blockage is cleared—can be very strong.

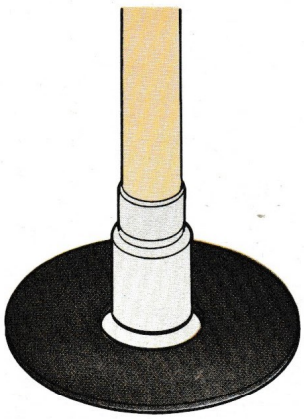
Make a habit of always twisting the rod downwards and upwards in a clockwise manner so that section joints are kept tight.

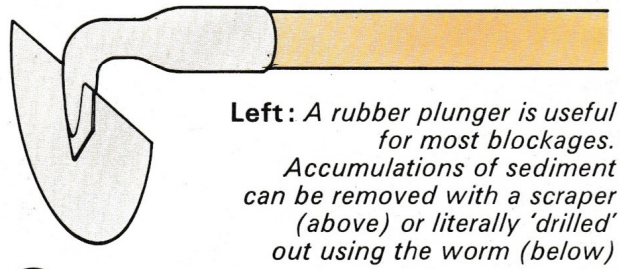


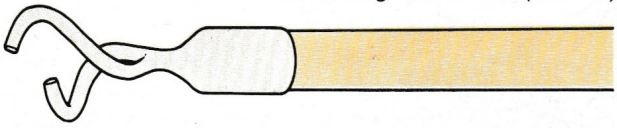
3. *Remove debris that caused the blockage*



4. *Hose down the cleaned inspection chamber*







Left: *A rubber plunger is useful for most blockages. Accumulations of sediment can be removed with a scraper (above) or literally 'drilled' out using the worm (below)*

Terry Allen Designs

Project

Build a four-poster bed

The traditional four-poster bed lends a touch of romance and elegance to any bedroom. This design can be used either to make a complete piece of furniture or as a basis to convert your existing bed

This easy-to-build design uses standard materials to achieve an authentic look at low cost. The turned wood spindles which are the main feature of the bed are standard architectural turnings which can be bought in many different lengths and patterns, allowing you to choose the look and style of your bed.

The designs given are for a complete bed base which can be made to suit any standard mattress. An even simpler alternative would be to omit the mattress frame and construct the base, spindles and canopy around an existing bed to save on both cost and construction.

Although the bed shown is made as a complete piece, removals can be a problem with such a large piece of furniture. If you want to take this into consideration, use screw caps for the corner joints so that the screws can be removed to dismantle the spindles and the canopy.

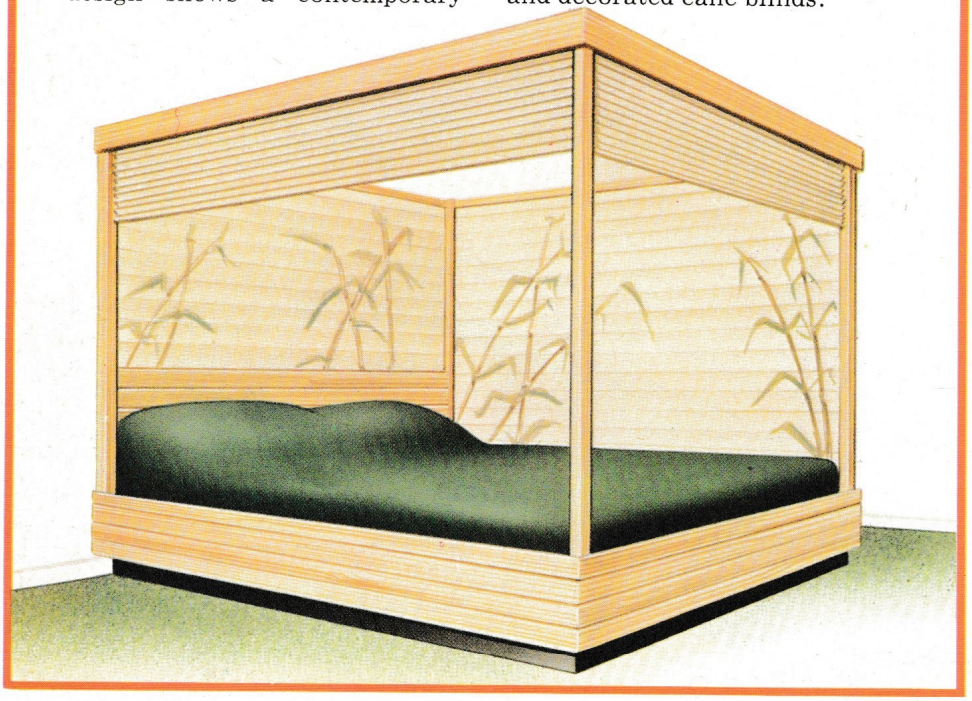
Choose between a varnished wood or a painted finish, using either veneered or plain chipboard. You will have to stain the spindles to match the veneer if you choose the former.

For a cosy traditional four-poster, fit curtains that will draw up between the posts. You can fit a removable awning for a real room-within-a-room feel. An alternative if you do not want to draw the curtains is to fit dummy folds of fabric to the corners and omit the awning—again helping you to save on materials.

Right: *The cosy four-poster in painted wood forms the focal point of this neat bedroom with its matching accessories*

Alternative idea

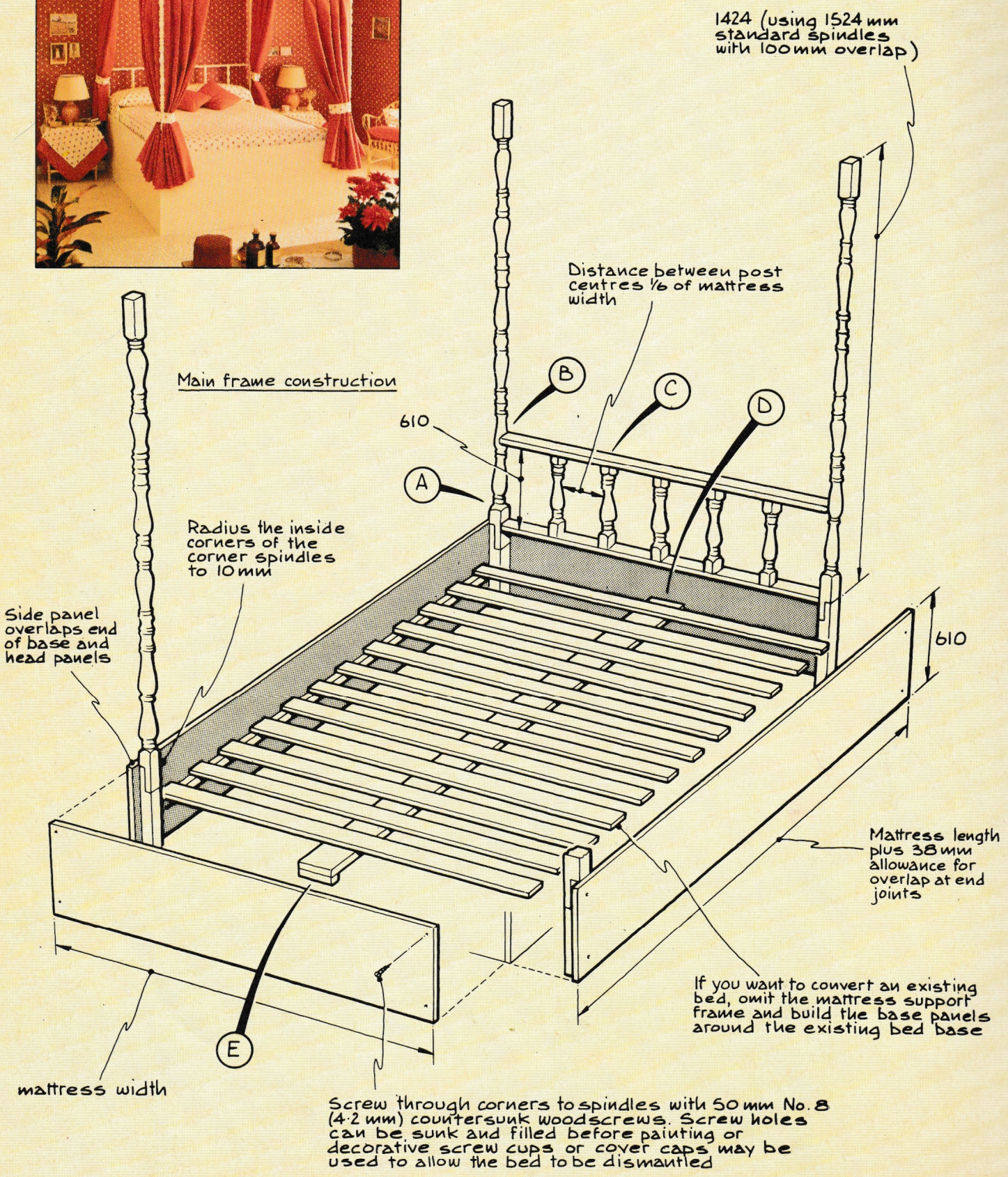
You can build a four-poster in many different styles. This design shows a contemporary style with an oriental air, made by using square-section posts and decorated cane blinds.



Advertising Arts

Jerry Tubby

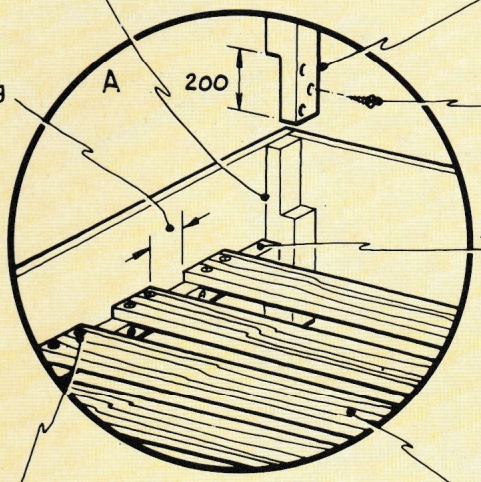
Workplan


1424 (using 1524 mm standard spindles with 100mm overlap)
Distance between post centres 1/6 of mattress width
Main frame construction
B
C
D
610
A
Radius the inside corners of the corner spindles to 10mm
Side panel overlaps end of base and head panels
610
Mattress length plus 38mm allowance for overlap at end joints
If you want to convert an existing bed, omit the mattress support frame and build the base panels around the existing bed base
E
mattress width
Screw through corners to spindles with 50 mm No. 8 (4·2 mm) countersunk woodscrews. Screw holes can be sunk and filled before painting or decorative screw cups or cover caps may be used to allow the bed to be dismantled

Extra length from 610mm of 75×75mm planed all round softwood

The halving joint is used to extend the corner spindles so that the square section can run the full depth of the bed frame and so the canopy can be set higher using standard length spindles

50mm spacing



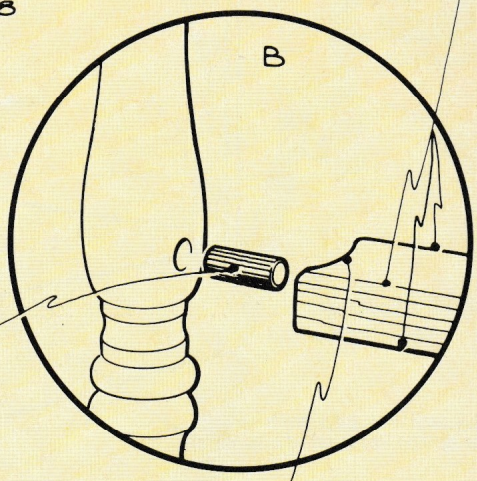
Join the two sections with 62mm No. 8 (4·2mm) countersunk woodscrews and PVA woodworking adhesive

Support batten from 25×25mm planed all round softwood fixed with 38mm No. 8 (4·2mm) countersunk chipboard screws at 150mm centres

Attach support rails to battens with 38mm No. 8 (4·2mm) countersunk woodscrews

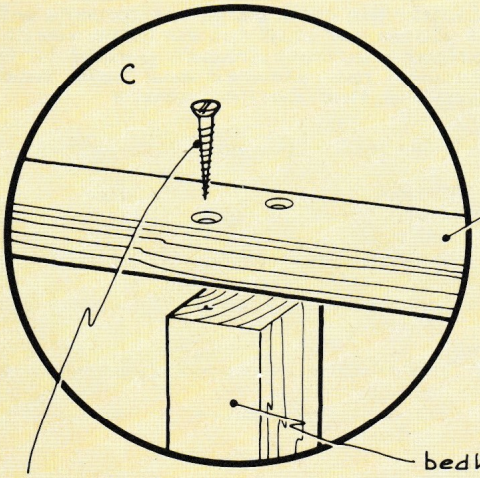
Mattress supports 75×25mm planed all round softwood

Radius these edges to 3mm



Join with a 9mm dowel and PVA woodworking adhesive

Bed head construction

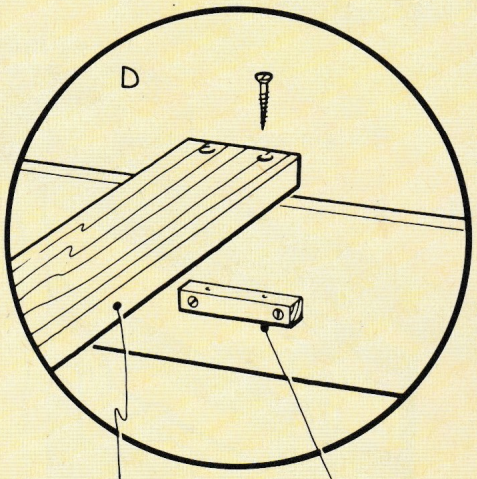


bedhead rail

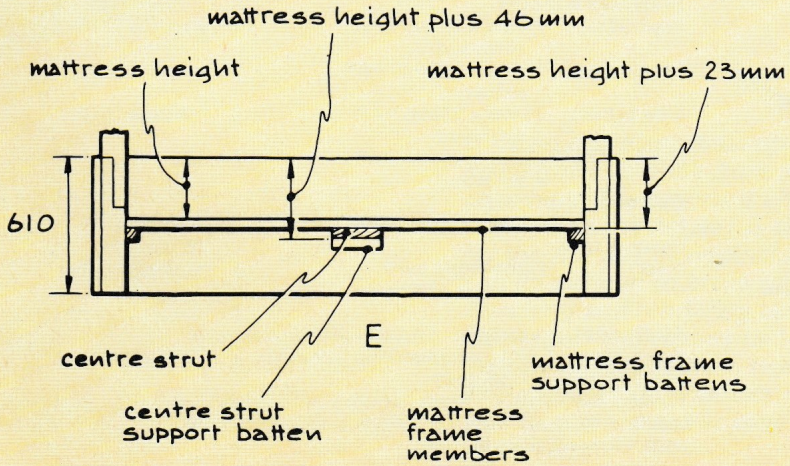
bedhead spindles

Join the bedhead rail to the spindles with 50mm No. 8 countersunk woodscrews and PVA woodworking adhesive

Cut the ends of the bedhead top rail to the curve of the corner post, using a template to mark out. Cut the curve with a coping saw or a power jig saw. Lower rail is dowel jointed to square section of post



Fixing the mattress supports

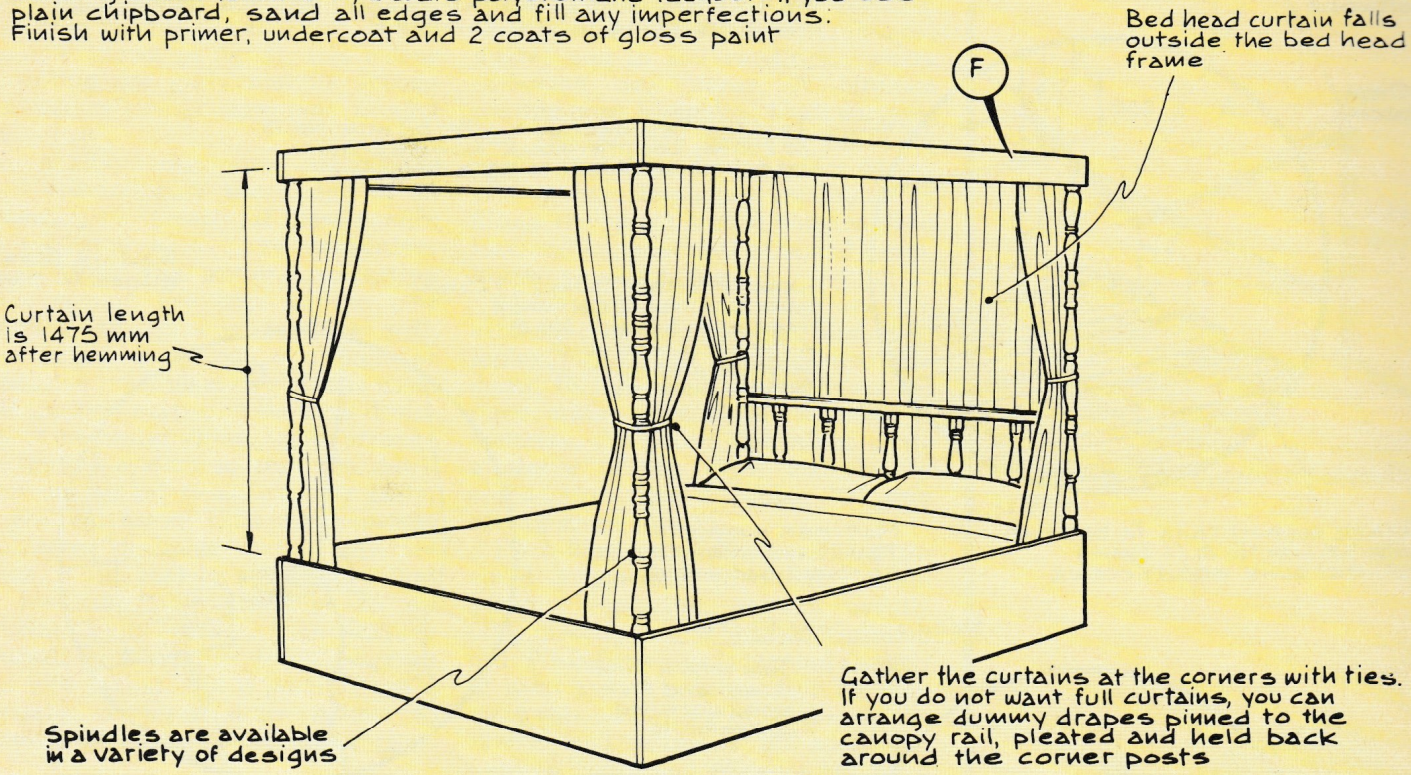


Centre strut from 100×25mm planed all round softwood. Screw to batten with 38mm No. 8 (4·2mm) countersunk woodscrews

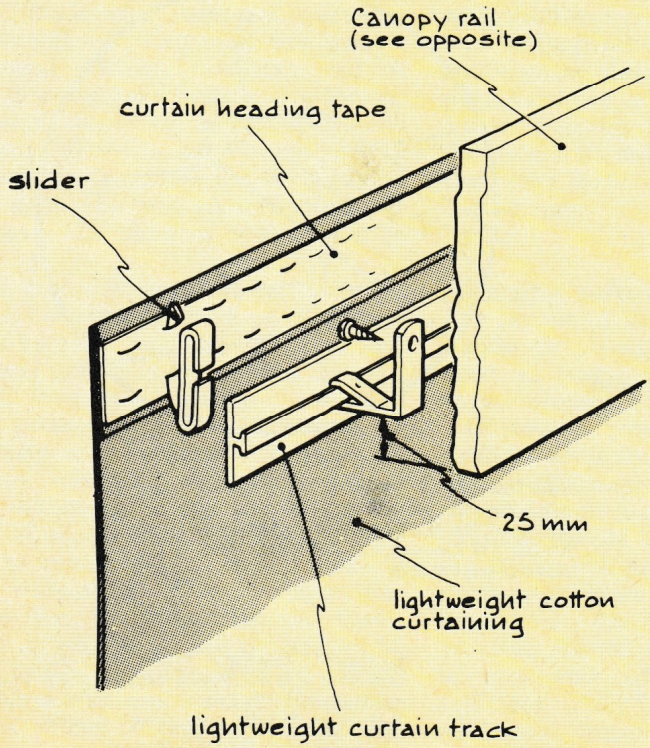
Support batten from 100mm length 25×25mm planed all round softwood. Screw in place with 38mm No. 8 countersunk chipboard screws

Advertising Arts

Finish: If veneered chipboard is used, finish cut edges with iron-on veneer edging strip. Stain bed posts to match veneer. Finish with 2 coats sanding sealer followed by 2 coats polyurethane lacquer. If you use plain chipboard, sand all edges and fill any imperfections. Finish with primer, undercoat and 2 coats of gloss paint


F
Bed head curtain falls outside the bed head frame
Curtain length is 1475 mm after hemming
Spindles are available in a variety of designs
Gather the curtains at the corners with ties. If you do not want full curtains, you can arrange dummy drapes pinned to the canopy rail, pleated and held back around the corner posts

Fitting the curtains F

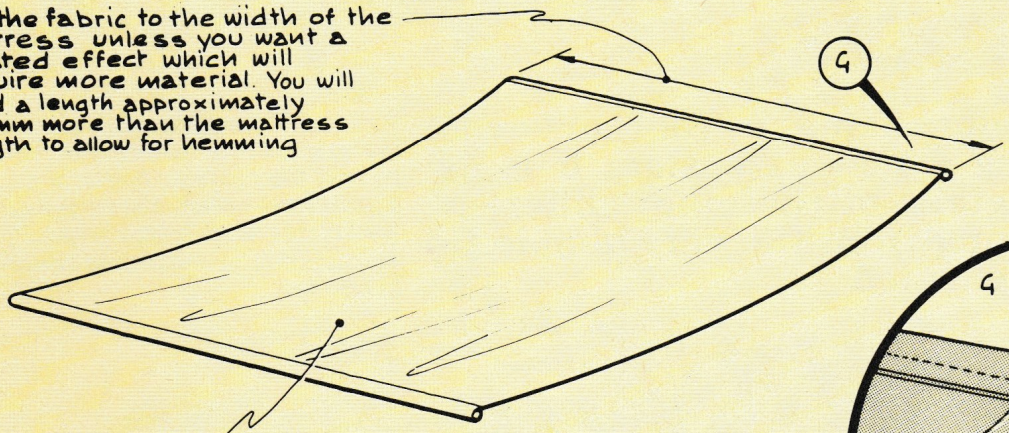


Cutting list
All sizes are in millimetres. Timber is planed all round (PAR)

Part	Material	No.	Size
Base frame	19mm chipboard or veneered chipboard		
Ends	19mm chipboard or veneered chipboard	2	mattress width x 610
Sides	19mm chipboard or veneered chipboard	2	mattress length x 610
Canopy frame			
Ends	12mm chipboard or veneered chipboard	2	mattress width x 125
Sides	12mm chipboard or veneered chipboard	2	mattress length x 125
Bedposts			
Spindles	75mm turned spindles	4	1524
Extensions	75mm x 75mm PAR softwood	4	610
Bedhead			
Spindles	42mm turned spindles	5	450
Rails	50mm x 25mm PAR softwood	2	mattress width less 150
Mattress support			
Support rails	74mm x 25mm PAR softwood	16	mattress width
Centre strut	100mm x 25mm PAR softwood	1	mattress length
Side battens	25mm x 25mm PAR softwood	2	mattress length
End battens	25mm x 25mm PAR softwood	2	100
Curtains			
Fabric	900mm cotton print		30 metres
Heading tape			16 metres
Track	Lightweight track, runners and hooks	2	mattress width
		2	mattress length

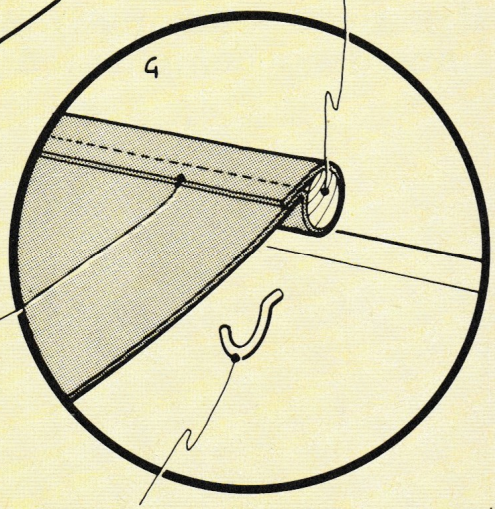
Additional materials: Countersunk woodscrews, countersunk chipboard screws, PVA woodworking adhesive, iron-on veneer edging (if using veneered chipboard)
Finish: Veneered: 2 coats sanding sealer followed by 2 coats polyurethane lacquer, stain for spindles to match veneer. Painted: Primer, undercoat and gloss topcoat

Cut the fabric to the width of the mattress unless you want a pleated effect which will require more material. You will need a length approximately 150mm more than the mattress length to allow for hemming



You can easily add a fabric awning if required. It is supported on dowels and hooks so that it is easy to remove for cleaning

12 mm dowel rod cut to the inside dimension of the end rails of the canopy less 150mm

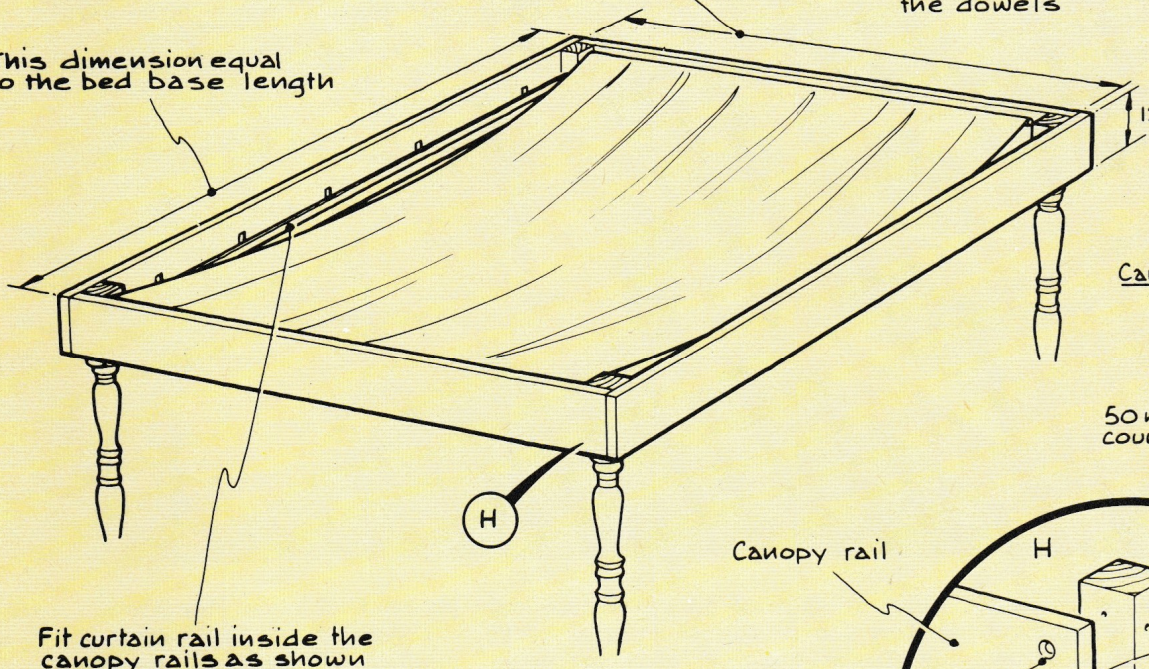


Hem the edge of the awning fabric so that the dowel is a fairly tight fit but easy to slip off for cleaning

Screw cup hooks into the canopy rail at 600 mm intervals to support the dowels

This dimension equal to the bed base width

This dimension equal to the bed base length

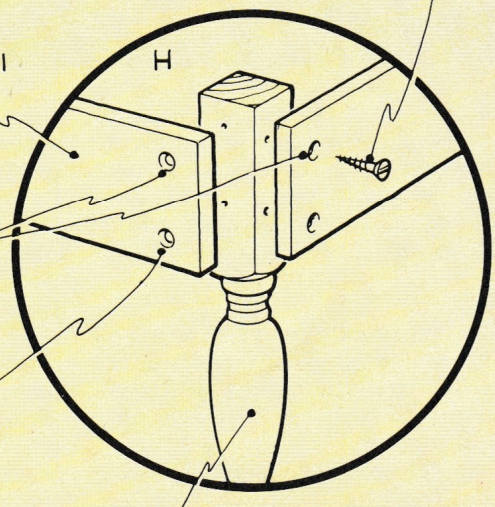


Canopy construction

Fit curtain rail inside the canopy rails as shown opposite so that you can hang curtains around the bed

50 mm No. 8 (4·2 mm) countersunk woodscrews

Canopy rail



Stagger the screwholes to avoid splitting the wood

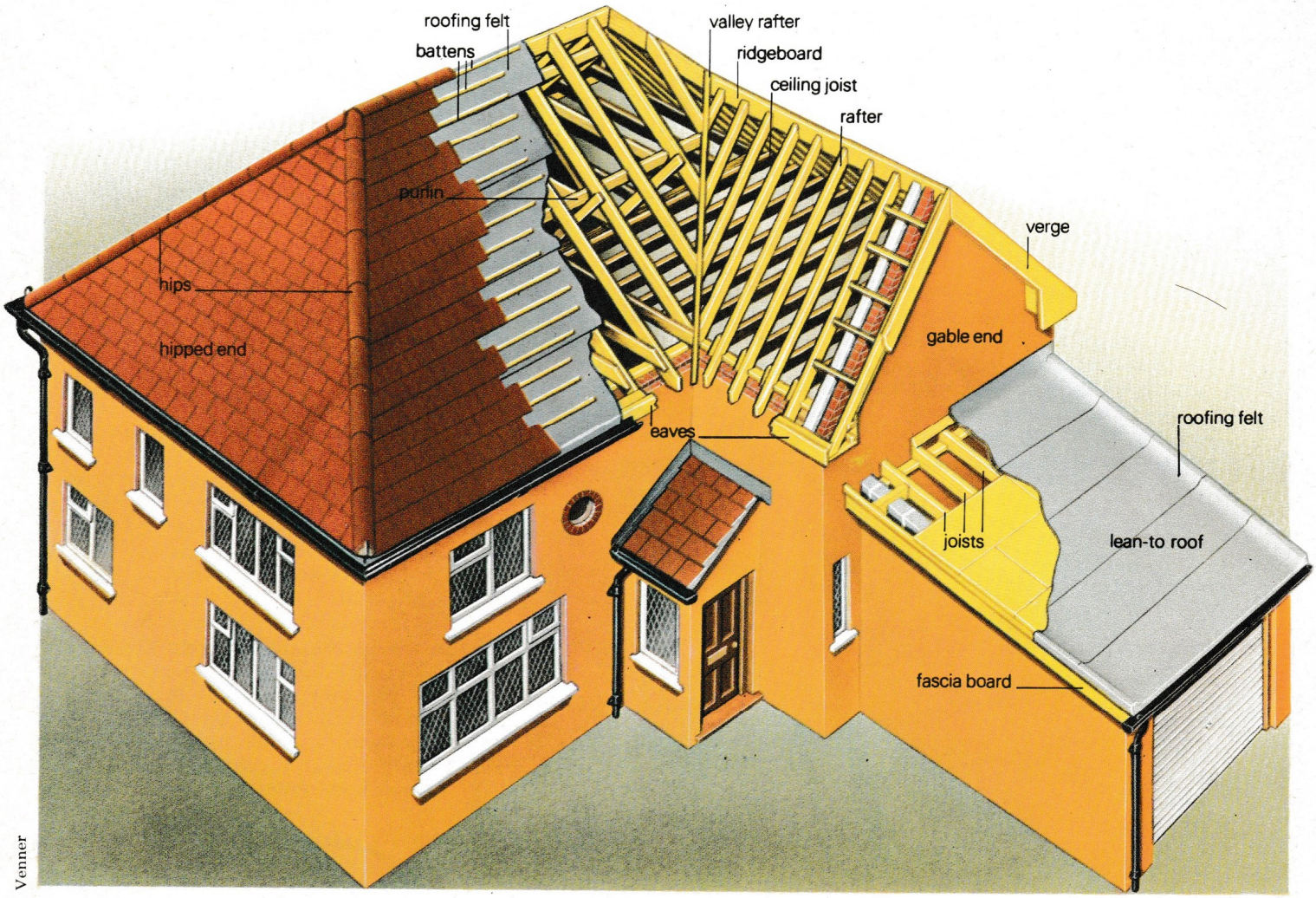
Countersunk holes can be filled flush after the screws are fitted, or you can use decorative screw cups or cover caps so that the bed can be dismantled

Corner spindle

Advertising Arts

All about roofs

Before you set about fixing a roof or even contemplate building a new extension, it is as well to know the details of the many different constructions—ranging from the very simple to the immensely complicated



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A. *There are a great many parts to the average roof as this illustration shows: the cutaway half of the roof exposes the rafters, the ridgeboards, wall plates, wall-bridge timbers and ceiling joists in a standard couple close roof*

It is not often that the handyman can expect to replace or build a complete roof. However, it is as well to know how the various types of roof are constructed in case repairs or additions do become necessary.

Flat roofs

Generally, any roof which has a slope of less than 10 degrees is classified as being a flat roof. In most cases, the roof only slopes enough to discharge any surface water.

Built-up felt roofs have a slope or *fall* of not less than 1:50, whereas on sheet lead or aluminium roofs, 1:80-1:120 is more common.

Flat roofs may be constructed of timber, concrete or sheet steel decking. Timber flat roofs are constructed in a similar way to suspended timber floors (see pages 182-187). The required slope is obtained by using tapered pieces of joist known as *firring pieces* (fig. D). These are fixed either parallel to the joists or across them, according to the surfacing applied to the finished roof.

Plain-edged, rough boarding is often used for the surfacing—planed or prepared boarding is more regular in appearance but also more expensive. Modern constructions tend to use one of the many sheeting boards such as plywood, chipboard or Stramit board—a compressed strawboard which is unaffected by vermin or wood rot.

These sheet materials come in large, 2400mm x 1200mm sections and their use means that supporting timbers can often be more sparsely spaced. The width of the boarding also gives a greater load-bearing capacity than single boards.

All timber used in roofing must be treated with a reputable preservative. Creosote is not satisfactory—particularly if the roof is to be finished with a built-up (bituminous) felt—as it damages bitumen.

The roof should also be ventilated

(fig. D) and covered with a suitable cladding. Felt is normally used for flat roofs, bonded together in three layers with hot bitumen or a reputable jointing compound.

Unless mineral chip-coated felt is used for the final layer, the finished roof is coated with 12mm stone chippings applied over an adhesive coating. This protects the surface and gives additional insulation and fire resistance.

In some areas, the local inspector may ask for a vapour barrier to be formed. Vapour is caused by the warm air from a building passing through the ceiling and insulation and condensing on the underside of the felt. Aluminium-backed plasterboard and/or hard, gloss paint applied to the ceiling provides an adequate vapour barrier under normal conditions.

Pitched roofs

A sloping roof is more aesthetic than a flat roof, provides better insulation from the elements and gives you useful storage space for enclosing things like water storage tanks and a central heating expansion tank.

The lean-to is the simplest type of pitched roof and is suitable for roofs with spans of 2.5m (fig. B). A lean-to emanates from the eaves and leans against a higher wall which, in most cases, is parallel to the load-carrying wall.

The double lean-to roof found on many older houses has a centre gutter formed down the middle of the roof and emanates from the gutter, one slope to each party wall (fig. B).

This type of roof usually has a parapet wall at the front and rear, and access to the roof is through a skylight from the top landing.

The couple roof (fig. B) is a poorly-designed roof which has a tendency to splay out at the eaves because there are no ties across the building to hold it. It is suitable only for small buildings and sheds.

The steeper the pitch, the more secure is the roof but a steep pitch can be used on larger spans only if the walls are thick and strong enough to resist the considerable downward forces.

The couple close roof (fig. B) is used mainly on smaller domestic houses. The ceiling joists are nailed to the feet of the rafters and the wall plate, preventing the rafters from spreading.

In this case, the roof structure becomes a separate unit which sits on support walls in one piece. It is suitable for spans of up to 5.5m.

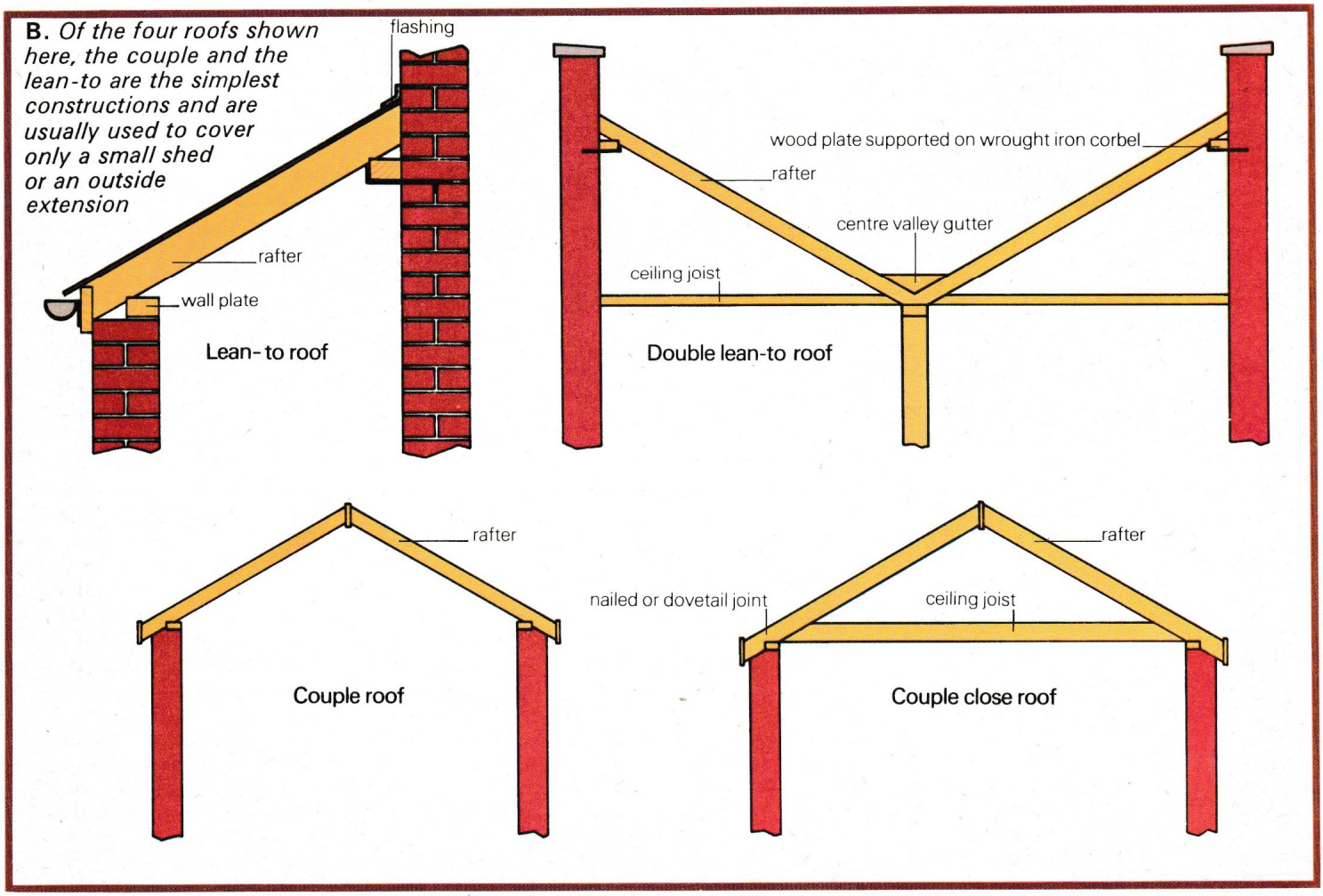
The collar roof (fig. C) is also a popular pitched roof for the smaller house since it allows part of the roof space to be utilized. The collars are braces across the roof rafters, set at about one-third of the roof's height, to form part of the ceiling. For example, if the height of the roof is 3m then the collars are placed 1m up the rafters. This means that the top storey rooms are partly in the roof.

The collars are either simply nailed to the rafters or jointed to them by means of large, dovetailed halving joints (fig. C).

Double or purlin roof

This type of roof is designed for use when the span exceeds 4.5m. Using single roof design in such instances is uneconomic because of the extra cost of the larger dimensions of timber

B. *Of the four roofs shown here, the couple and the lean-to are the simplest constructions and are usually used to cover only a small shed or an outside extension*



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which are needed.

Purlins are the horizontal members of a double roof, fixed under the rafters to give additional support. They in turn are supported by struts from a plate on top of the ceiling joists with a bearing over a load-bearing wall or partition (fig. C).

Additional strength can be obtained by fixing collars at every four or five rafters. The purlins are supported in a variety of different ways according to the age of the house (see below).

Mansard roof

This type of roof was very popular in Victorian times when timber and labour were much cheaper, but it has not been used much since the turn of the century. In recent years, however, mansard roofs have been used on some newly-styled town houses.

These houses have three floors and by far the most economical method of building the roof structure is with a lightweight truss. Here, much of the heavy timber is replaced by smaller-section members secured by circular timber connectors and rectangular truss plates. The shape of the roof allows maximum use of the roof space and offers little obstruction to sunlight around the building.

Hipped roof

The most economical method of building a roof uses two slopes which rise to a point. The triangular ends are then filled in with brickwork; these are known as *gable ends* (fig. A). But these ends have a tendency to look cheap as well as clumsy and to improve the aesthetic nature of the roof, hips are formed in their place. This is done by sloping off the ends at the same pitch as the roof (fig. A).

The rafters which meet the intersection of the hip are known as hip rafters and the rafters fixed to them as jack rafters. The stresses or 'double-thrust' at the junction of the two slopes necessitates having dovetailed halving ties fixed to the right-angle of the two wall plates.

Roof design

Generally, sloping roofs give better insulation to the rooms below, being cooler in summer and warmer in winter. The air space in the room also provides a barrier against high outside temperatures.

It is the smaller units—slates, tiles—used in a sloping roof which provide the most insulation. These are lapped so that the thickness of the covering is greater than that of the sheet materials used on flat roofs.

The older type of roof was not usually insulated with felt under the slates or tiles and the open roof space was always very draughty from the open joints. In the UK, modern roofs have to be insulated against the elements to conform with the Building Regulations in respect of heat loss from buildings.

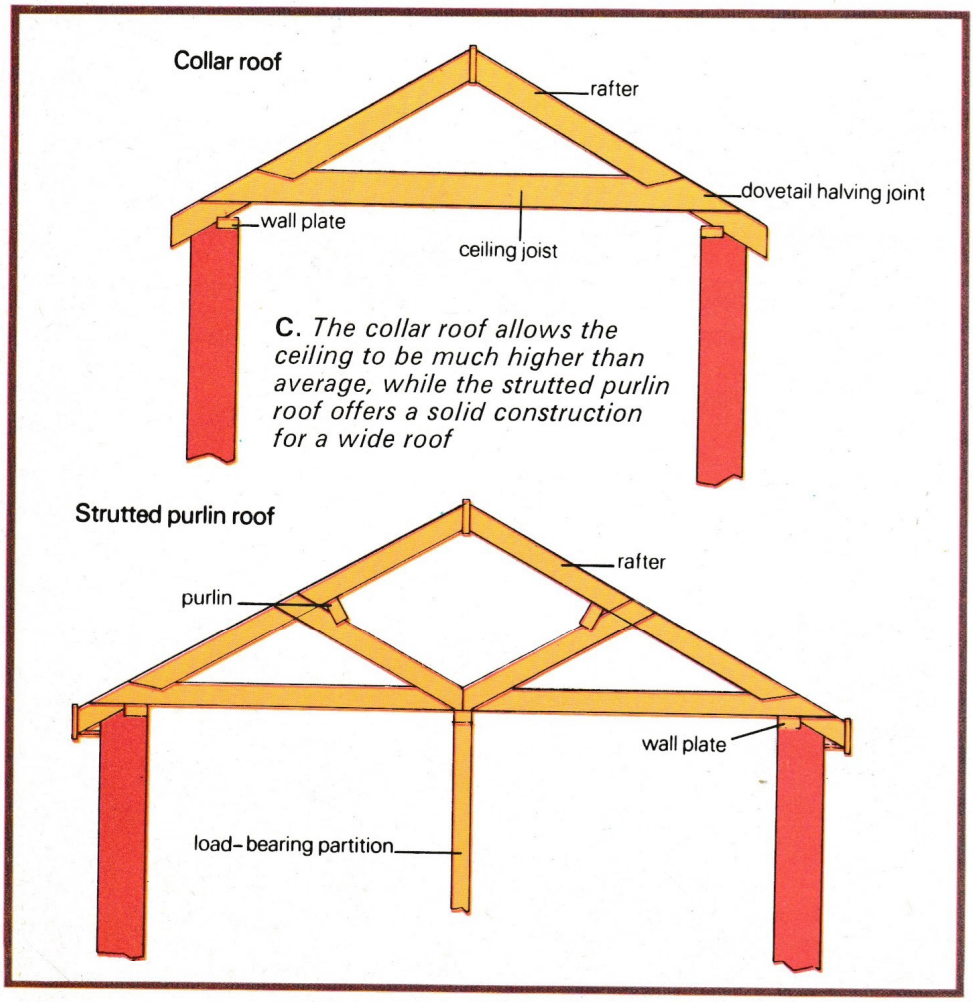
If a roof is constructed in the correct manner, it does not need anything to hold it together because it is a complete unit braced against any movement. But weakness can occur at the places where the roof structure is held in place on the supporting walls.

Older types of roof, whether flat or pitched, are not held down to the walls other than by the building-in of the rafter feet and joists into the top courses of the brickwork. However, most building regulations now enforce the fixing or tying down of the roof to the walls. This is achieved by fixing galvanized metal brackets and ties (wall plates) which are screwed or bolted to the timbers and continued down several courses of the brickwork. It is essential that a modern, lighter type of roof is secured in this way as it is more likely to be lifted in strong winds. Single-lap tiling—popular on sloping roofs—is much lighter than the traditional plain tile, so roofs which employ it must be securely tied also to hold them in place.

Some useful lightweight galvanized steel components have been developed in the field of roof anchoring, such as joist hangers, restraint straps and herringbone-type joist struts. All of these conform to the various sections of the UK Building Regulations dealing with fire prevention, lateral support of floor joists and horizontal and vertical restraint. The components are designed to be as simple as possible, facilitating their use by the home handyman.

Timber for roofs

To conform with most building regulations roof timber must be well-seasoned, free from large knots and contain less than 15 per cent moisture. It is a good idea to check any timber you may purchase from the builders' merchants to make sure that these requirements are satisfied.



C. *The collar roof allows the ceiling to be much higher than average, while the strutted purlin roof offers a solid construction for a wide roof*

Rafters

Dimensions of rafters depend on the span of the roof and the type of roof covering. Sizes vary from between 38mm x 75mm to 50mm x 125mm, the most common size for houses being 50mm x 100mm.

The rafters are pitched at a predetermined slope from the wall plate up to the ridge board at 375-450mm centres. Each rafter should be splay-cut (angled) at the ridge and fitted over the wall plate with a bird's-mouth joint. They are secured to both ridge and wall plate by means of wire or cut nails skew-nailed for greater strength.

Rafters should be set in pairs immediately opposite each other at the ridge to give maximum strength and rigidity.

Wall plates

These usually come in two sizes—100mm x 50mm or 100mm x 75mm. Wall plates are bedded in cement mortar and levelled at the top of walls. At the joints and angles they are jointed with a sawn halving joint and secured by nails at each intersection.

Metal straps may be fixed to the plates and either screwed to the top six courses of the wall or built into the mortar joints.

Purlins

Dimensions of these vary according to the weight on the roof, the pitch of the roof and the overall span and length—125mm x 50mm or 100mm x 75mm are common sizes. They are set horizontally and parallel to the ridge and the wall plate at about half-way up the slope of the roof (fig. C). Purlins are intended to take up any sagging which may occur in the rafters.

The rafters are sometimes bird-mouthed over the purlins, in most cases they are set at right-angles to each other. Struts are then put in to support the purlins at regular intervals, resting on a plate laid either across the ceiling joists or on the wall plate of a load-bearing partition wall.

The ends of the purlins are supported on a brick corbel built out on the party or external main walls, on metal hangers, or on the inner leaf of a cavity wall.

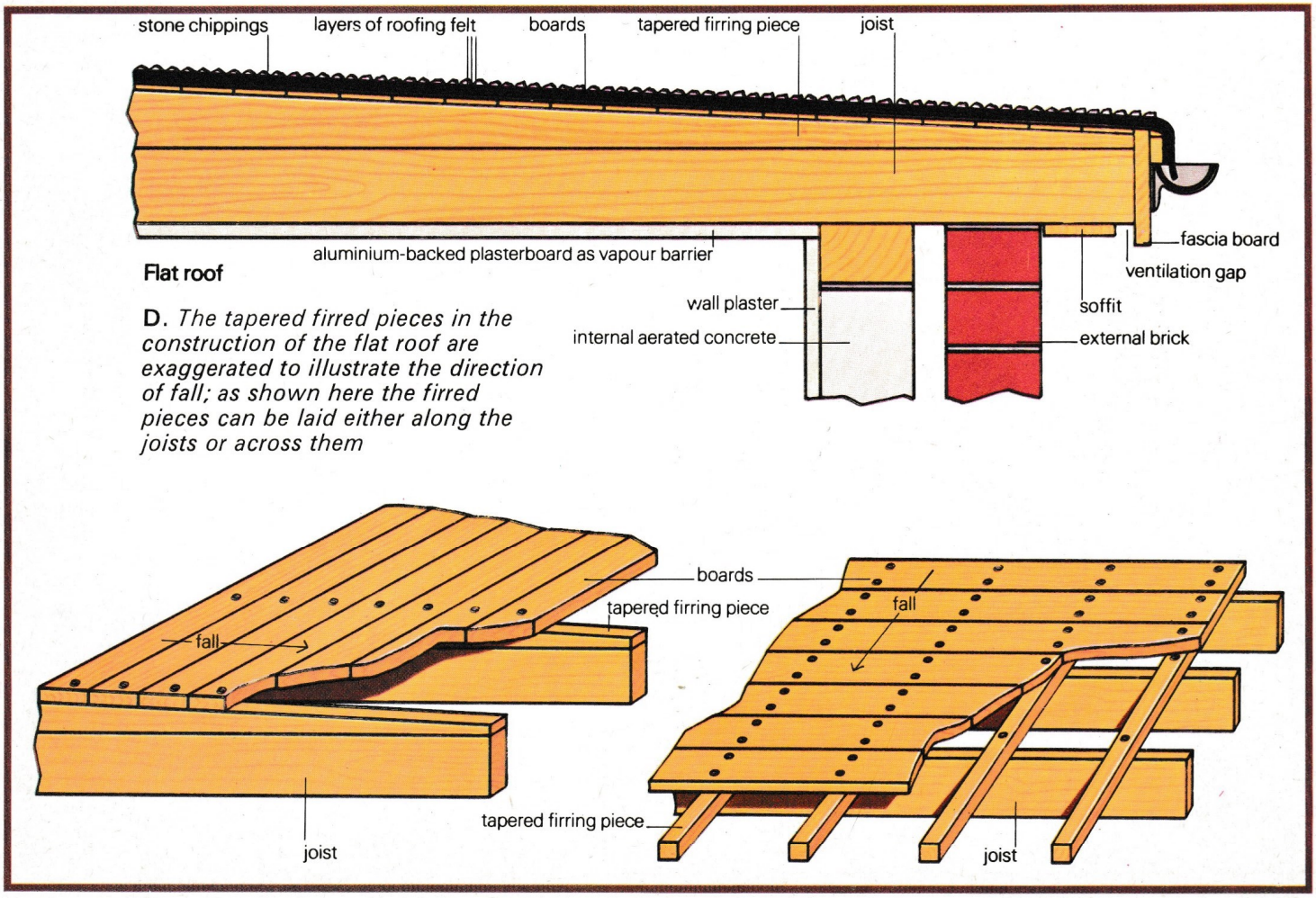
Ridge-boards

A ridge-board is usually 150mm x 38mm or 175mm x 38mm, depending on the pitch of the roof. A shallow-pitched roof does not need so deep a ridge as a steeper one, where the splayed-cut is longer. Where the rafters meet the ridge, they are splay-cut to the angle of the ridge-board and nailed into the ridge in opposing pairs (fig. A).

The ridge-board is fixed horizontally, parallel to the wall plate. When building a roof, it is good practice to temporarily set up a pair of rafters at each end of the ridge and then set out the spacings for the permanent rafters. On completion of the spacings, the temporary rafters are removed and incorporated as necessary into the project.

Ceiling joists

Usually 100mm x 50mm, ceiling joists are fixed horizontally across the span of the roof and parallel to the rafters (fig. B). The joists rest on the wall plate at the side of each rafter and are secured with nails to the wall plate and the foot of the rafter.



D. *The tapered firred pieces in the construction of the flat roof are exaggerated to illustrate the direction of fall; as shown here the firred pieces can be laid either along the joists or across them*

Roofing 1

Roof coverings

Flat roofs are generally covered with sheet materials such as bituminous felt, sheet zinc, copper, aluminium or lead which can be laid in large bays. These are separated by specially-shaped batten upstands and flashings, usually at the joints of the covering.

Bituminous felt is sealed at the joints with a special sealing compound. The first layer should be nailed to the decking with galvanized clout nails at 150mm centres with a 50mm overlap between sheets.

Subsequent layers are folded at the seams and the joints soldered or joined with a lapfold appropriate to the type of metal sheet being used.

Mastic asphalt is laid on flat roofs in three coats, each coat being so arranged that the joints of the upper coats do not coincide with those below. Angles are strengthened by means of a small cove which gives additional weather resistance.

Asphalt is not to be recommended for timber-boarded roofs because the shrinkage movement of the timber can have disastrous effects on the surface. Chipboard, resin-bonded plywood and Stramit boards are not affected by the elements and so provide a more suitable base.

However, if the area to be covered is small, asphalt is both an uneconomical and an inconvenient proposition: a pot of asphalt has to be 'brewed' on-site and the application of it takes a very patient, skilled hand.

Sloping or pitched roofs are usually covered with tiles or slates. Nowadays the cost of traditional slates can often be prohibitive and as a result, cheaper, lighter asbestos slates have become more popular.

Tiles can be made from clay, which is burnt much in the same way as bricks, or from concrete. There is little difference in either the cost or the weight of these types, so choice is much more a matter of personal preference. The right tile is, in fact, important as it affects the character of your house.

The single-lap interlocking tile is a popular type of concrete tile and when correctly fixed, has a long life comparable to that of any plain concrete or clay tile.

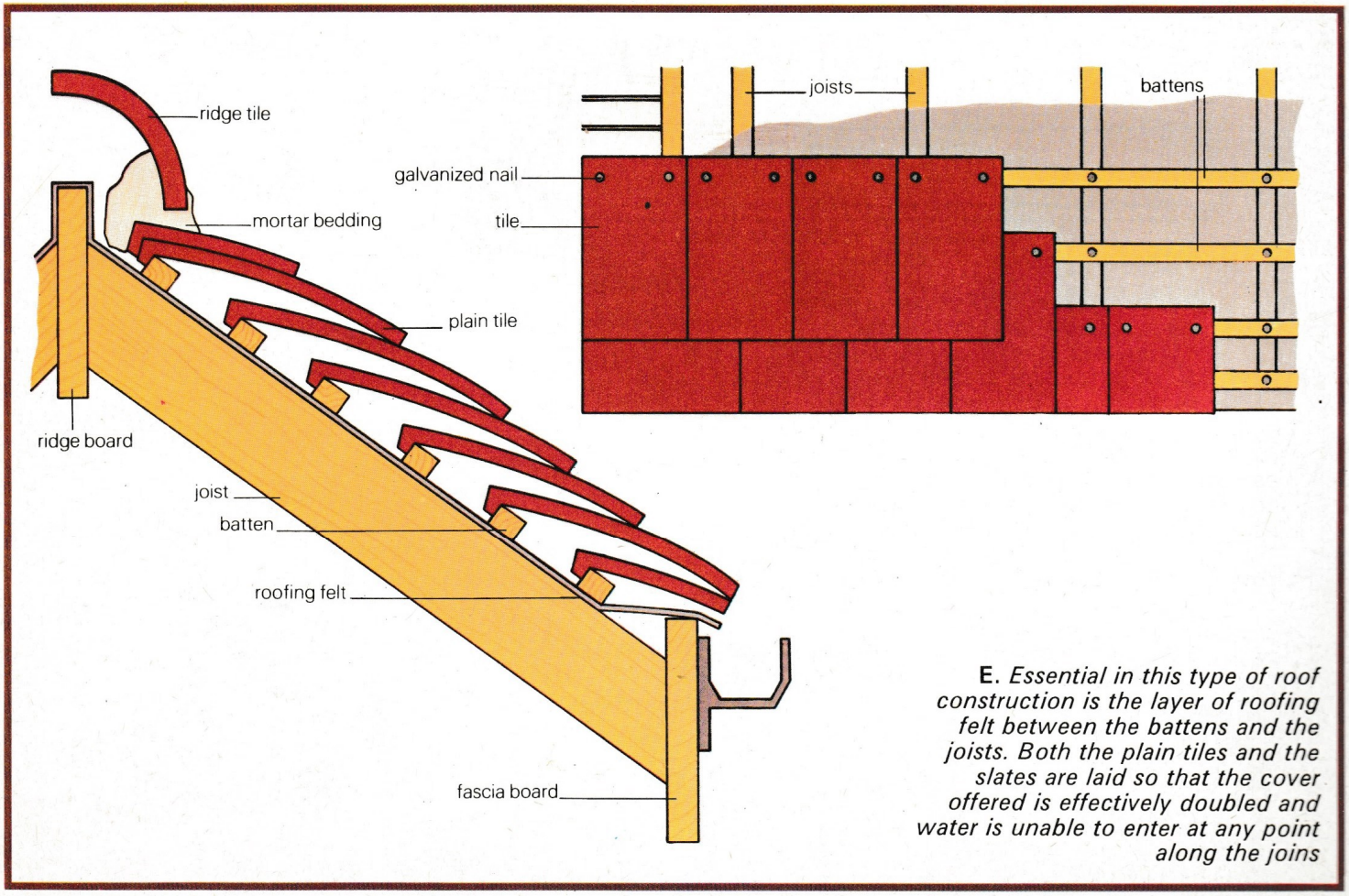
Plain tiles measure approximately 250mm x 160mm and are laid with a double lap, resulting in a much heavier roof than one made with single-lap tiles. The weight of single-lapped tiling is about 40 percent less than that of plain tiles, making it possible for the roof timbers to be lightened accordingly.

Interlocking single-lap tiles are made in various sizes from 375mm x 225mm to some that have a covering capacity of six or seven to the square metre. They are made in shades of grey, green, light and dark reds and are generally sand-faced.

Fixing slates and tiles

Both slates and tiles are fixed to wooden battens which are nailed at right angles to the rafters at regular intervals, according to the size of the tile or slate being used. The nails used should be zinc, copper or of the thin galvanized type specially designed for this purpose.

Each slate is fixed with two nails. Tiles are made with special nibs on the back (fig. E) which fit over the batten and are nailed every four or five courses through purpose-made holes. Tiles at eaves, verges and gables should be nailed at every course to prevent lifting in strong winds.



E. *Essential in this type of roof construction is the layer of roofing felt between the battens and the joists. Both the plain tiles and the slates are laid so that the cover offered is effectively doubled and water is unable to enter at any point along the joins*

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Where to buy it—UK

The drains underground Page 406
Information on the British standards for underground drainage can be obtained from the British Standards Institution, 101-103 Pentonville Road, London, N1 9ND. Quote reference number 301 for building drainage and 2005 for information on sewerage.
Information on the various types of piping available can be obtained from the following trade associations.
Asbestos cement pipes: Asbestos Cement Manufacturer's Association, 15-16 Took's Court, Cursitor Street, London, EC4 1LA.
Cast-iron pipes: British Cast Iron Research Association, Alvechurch, Birmingham B48 7QB.
Clay pipes: Clay Pipes Development Association, Drayton House, 30 Gordon Street, London WC1H 0AN.
Concrete pipes: Concrete Pipe Association, Brenchley, Tonbridge, Kent.
Plastic piping: The British Plastics Federation, 47 Piccadilly, London W1V 0DN. Also The Plastics Institute, 11 Hobart Place, London SW1W 0HL.
Information on bedding materials for underground pipes can be obtained from: The Sand and Gravel Association of Great Britain, 48 Park Street, London W1Y 4HE.

Build a four-poster bed Page 414
Wood spindles are obtainable from branches of Magnet Joinery Ltd., Head office: Keighley, West Yorkshire.

All about roofs Page 420
Information on suppliers from: National Federation of Roofing Contractors, 15 Soho Square, London W1V 5FB.

Acknowledgements

Build a four-poster bed Page 414
Chairs and tables from: Cane and Table, Rosslyn Hill, London NW3. Wallpaper from: Paper Moon, 12 Kingswell, Heath Street, London NW3.

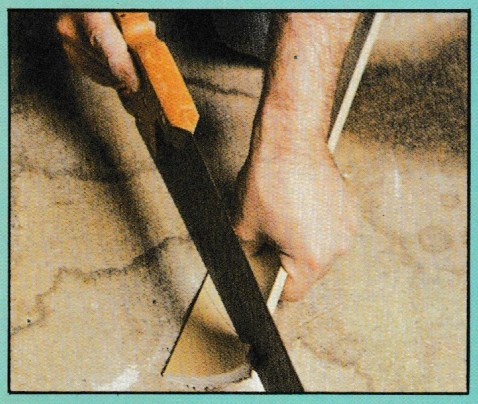
Australia

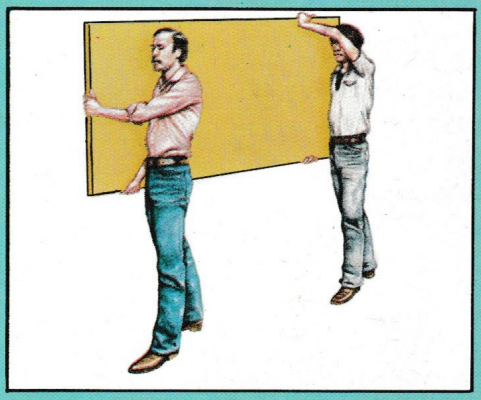
The drains underground Page 406
All plumbing work in Australia must be carried out by licensed plumbers or contractors.

Build a four-poster bed Page 414
To obtain the wood spindles used as the bed posts look in Yellow pages under 'Wood turners' and 'Wood ware'.

All about roofs Page 420
Information on roof construction and suppliers from Experimental Building Station, Delhi Road, North Ryde, NSW. Also try the Building Information Centre, 525 Elizabeth Street, Sydney and the department of Housing and Construction in each state.

In next week's issue





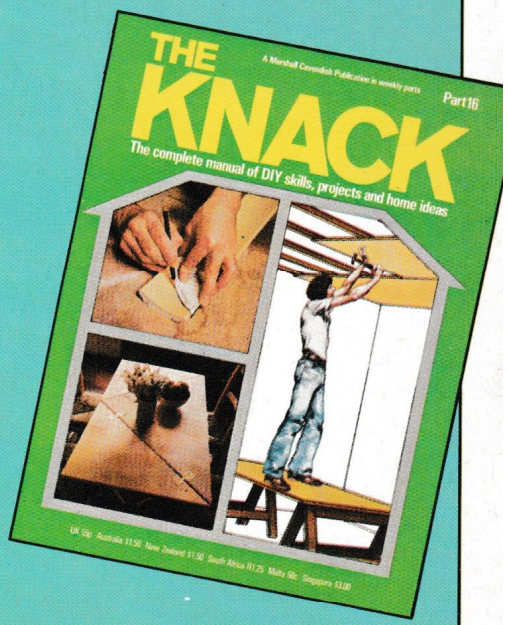
Lighting for kitchens and bathrooms: So often the kitchen and bathroom lighting relies on a single bulb or flourescent strip. We show you how to liven up these areas, with daring, but inexpensive lighting schemes that will add flair and glamour to your bathroom, whatever your decor.

Repairing covings: Covings and cornices form a decorative link between the walls and ceiling of a room. This link is destroyed if they are in need of repair or replacement. We run through the various repair techniques with simple-to-follow step-by-step instructions so you can get the job done cheaply and quickly.

A foldaway table: Our novel design for a corner table that opens out into a full-sized dining unit will save you a fortune, and is easily built with basic carpentry skill and a few spare hours. When not in use the table is a handy corner stand for plants or the TV.

Handling sheet materials: All you need to know about storing, handling, measuring and cutting sheet materials —invaluable construction hints.

Painting walls and ceilings: How to paint ceilings and murals the easy way with a roller or brush. And how to get the best finish without back-breaking effort. Plus hints and tips on using ladders and the best way to go about the work so as to create the minimum of inconvenience.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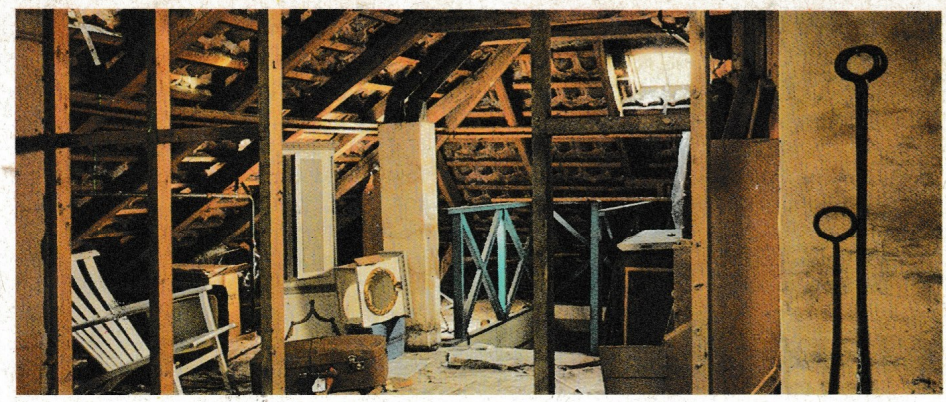

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